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After 40—What?

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In Collaboration With
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A FOREWORD

THE diseases described in this book are, with the exception of those of the prostate gland, mostly diseases associated with the cardio-vascular system, that is, the heart and the arteries. The kidneys are largely affected because of the fact that the renal arteries and their branches in the kidney have undergone changes which interfere with the carrying of the proper amount of nourishment to those organs. This results in degenerative changes in them and an interference with their proper function.

Many heart affections as well as disorders of the circulation are also due to arterial changes in the form of sclerosis or hardening.

But all of the diseases discussed which are prone to develop after forty years of age, whether they be of cardiovascular origin or otherwise, can be relieved and doubtless in many cases cured, by persistently and faithfully following out natural methods such as are herein suggested. There are of course, cases in which disease has progressed so far that marked relief is not to be expected, yet in most cases which do not present such marked structural changes that nothing is to be hoped for from any form of treatment, material relief very often may be obtained.

The methods advocated by Bernarr Macfadden during the past fifty years are natural methods. Nature is a

FOREWORD

great physician. She can often accomplish what human hands are powerless to achieve. This has been proved over and over again in thousands of cases. Therefore, give Nature a chance. Obey her laws, live as she intended us all to live, make liberal use of her gifts—fresh air, sunlight, natural foods, water, sleep. Do this and obey her laws as to proper living in regard to exercise, bathing and recreation and nothing but good can come out of it. Health will be restored when it has been lost. Vitality, vigor and strength will be maintained, existing disease will be driven out of the system and all fear of future disease will be banished. Life will again be worth living —will be something which can be enjoyed to repletion and it may be prolonged not to three score years and ten, but to more than this quota of years of happiness, health and contentment.

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AFTER 40 — WHAT ?

CHAPTER ONE

Your Health After 40

AFTER forty—what? The answer should be: After forty, retained vigor and vitality, full enjoyment of life, an existence filled to repletion with happiness, contentment, energy and ambition.

Why is it that so many people cling to the idea that after men and women have passed the age of forty years they are naturally on the downward path facing toward the setting sun, beginning to disintegrate, to lose their health and vitality, getting ready to take their place “on the shelf” with other useless members of society? Nothing is more foolish; nothing is more untrue. After forty should come the very best part of one’s life if—and here comes in the *if*—that little word which proves a stumbling block to so many plans, to so many ambitions, to so many aspirations. “I could make a fortune *if*—”; “I could own the biggest business in the world *if*—”; “I could be in the best of health *if*—.” That if, my friends, is a very poor alibi as a rule. “I could make a fortune *if*—I only had an opportunity”; “I could own the biggest business in the world *if*—my abilities were only appreciated”; “I could be in the best of health *if*—I wasn’t too

busy to do the things I should do in order to attain that greatly to be desired condition!" The *if* is the alibi, the word which puts failure up to the other fellow, which so to speak, "passes the buck." It is never our own fault that we are not rich, that we do not own the biggest business in the world, that we are not in the best of health. It is always the fault of someone else, that is, according to our own views.

But, while such alibis may have the effect of quieting our own consciences, or satisfying our own vanity, and while they may fool us for a time they don't fool those whom we want to fool. We are prone to blame others for our own shortcomings, for our lack of success, for the many things that go wrong with us financially, morally, physically. If we lose money it isn't because of our poor judgment—it is because we were "roped" into a bad investment against our own better judgment. If we fall from grace, it is not our fault, oh no—we were seduced by some siren, some alluring creature who "hypnotized" us! If our health becomes broken it is not our fault, we couldn't help it, of course not. Our social duties compelled us to do so many things which we knew we shouldn't have done; we had to stay up too late, we had to eat too much, to drink too much, to smoke too much! Our business kept us from getting the required amount of exercise, or made us hurry too much or worry too much or eat too hurriedly, or caused us too often to neglect the calls of Nature.

But whom do we fool? No one. Not even ourselves. In these days, when the majority of people are health-conscious, when they *know* what they should do to at-

tain and maintain a condition of normal health, there is absolutely no excuse for those who fail to possess it.

Ignorance in Matters of Health Is Decreasing. In the dark ages, when little or nothing was known of matters pertaining to sanitation and health, when people lived in dark, badly ventilated homes, lacking even the simplest sanitary appliances, when a bath was looked upon with almost holy horror, when food was eaten uncouthly, chewed little, swallowed in chunks and washed down with large potions of ale or other liquids, there was possibly some excuse—that of ignorance. But we no longer live in the dark ages—we live in an enlightened age, in an age in which the people have become educated in matters of health, an age in which there is no excuse for any one to neglect his or her physical condition. We are no longer ignorant; we have been taught the value of fresh air, of sunlight, of proper foods, of exercise, of rest, of relaxation, of proper elimination and of a correct mental attitude.

We know all of these things yet how many of us put our knowledge to proper use? How many of us can raise our right hand and say that we are living as we know we should live, that we are doing what we know is the right thing to do? Very few of us. We know what to do but we simply fail to do it. And at what a cost! If every man lived as he knows he should live in order to attain and maintain normal health such books as this need never be written. No one would have any use for them. And we would live on and on until we gradually wore out like the old "one-hoss shay" which its owner drove around for so many years that no one remembered just when the old

vehicle was new, and when it finally broke down it broke down *all over* and all at the same time. It just wore out—but not before its time.

Unfortunately human beings are not like the one-hoss shay of the old poem; they don't watch themselves carefully during their lives, doing what should be done and leaving undone what should not be done. The owner of the old chaise carefully washed it and greased it and kept it in the best of condition so that it outlasted all other vehicles within its owner's memory. But human beings let themselves go, they neglect themselves in every way.

They may occasionally work up a little spirit when they notice something wrong with themselves; perhaps they go to a doctor and get a little medicine which may ease some of their pains or aches or may help to temporarily get rid of some abnormal condition. But this does no real good. Just being relieved of some symptoms, or getting rid of some disturbing condition for the time being is not going to help a lot. Such persons are only fooling themselves. They must quit doing the things which bring on these abnormal states of health. What good does it do to take a powder containing some poisonous coal tar product to relieve a headache? To be sure the headache goes away—for a time, but the condition which caused the headache has not been eradicated and soon another headache will develop.

And what is true of headache is true of practically all disease. The cause of the disease must be discovered and removed or the disease will not be cured, but will be only temporarily relieved. There is but one way to prevent disease and that is to *live properly*.

How Long Should Humans Live? What is the allotted span of the life of man? Three score years and ten you will say of course. Let us consider. Do you know that most of the lower animals, unless they meet death by being killed, live five times the length of time it takes them to mature? For example, if an animal matures in two years its expectancy of life is ten years; if it matures in five years its life expectancy is twenty-five years. What is true of the lower animals should be true also of the human race. How would it apply to them? Let us see. Human beings are not thoroughly matured until about twenty-one years of age. Their expectancy of life therefore, should be one hundred and five years! And I do not at all doubt that, were we to be born with no handicaps and were we to live as Nature intended us to, we would stretch out our span of life to the above figure and then only pass on because we were entirely worn out *all over* and not from disease of any one organ or other part of our body such as now happens.

Only on very rare occasions however, does a man or a woman reach the age of one hundred years or more. We are carried off *prematurely* by disease of some kind or other. When we say prematurely we mean just that and nothing else. With a natural expectancy of life of one hundred and five years, anything short of a century is premature. This is perhaps extremely optimistic but optimism is one of the qualities which make for prolonging life, and we want to live as long as possible. Optimism is *constructive*—pessimism is *destructive*. What is constructive helps to build up; what is destructive helps to pull down. Optimism therefore, may be classed with con-

structive thinking and constructive thinking is an aid to the development of health and longevity.

Everyone Entitled to Normal Health. When anyone dies from disease it means that either that person's knowledge of how to live is deficient, or, if he have that knowledge, that he has not applied it as it should have been applied.

Everyone is entitled to normal health; everyone born without hereditary handicaps *can* have normal health. It only remains for us to apply our knowledge of correct living to our own lives—to make use of this knowledge in the proper manner. We will then have nothing to fear. Disease will be a stranger to us. We will live out our allotted time and enjoy life to the limit. Man takes the utmost care of his domestic animals, of his horse, his cow, his dog. Yet he neglects himself shamefully.

The great trouble today is that we take so little account of ourselves. We think that because we do not feel sick there can be nothing wrong with us, that we are in the best of health, that nothing can happen to us. In an article written by Mrs. Jenness Miller, an internationally known writer and teacher of health building and dress reform, she stated that she was talking with an old man one day about health and other matters and he remarked that he thought "Few mortals would live to grow up if the Almighty hadn't made some things about 'em so they'd keep running in spite of their own foolishness." And that is a fact. Nature must have some "fool proof" tricks that keep us going in spite of ourselves.

We Can Neglect Ourselves Just So Much and No More. But that is the way with us. As long as we feel

fairly well we go on doing everything in the world which is wrong and take no heed for the future. This can go on just so long and no longer. Something is bound to happen—perhaps suddenly—but more often gradually and insidiously. We do not notice anything wrong for a long time or if we do we make light of it, pay no attention to it. Then at last comes a time when we have forced upon us the knowledge that we have become the victims of some slowly developing chronic disease or some abnormal condition which should have been averted had we lived as we know we should have lived—had we done what we know we should have done. And now, perhaps, it is too late. We have developed some condition of ill-health that can only be eradicated by long and tedious treatment or perhaps cannot be eradicated at all and which will eventually drag us down to a state of chronic invalidism or perhaps rob us of life itself.

The tendency is so often to wait too long, to wait until we fall victims to some disease and then to try to cure it. How much better to adopt measures to *prevent* the development of disease. How much happier would we be if we *knew* that we were the complete masters of our bodies and that we had risen above the possibility of contracting disease; that, owing to a perfect state of health we were immune to sickness of any kind and need have no fear of it. It is so much easier to avoid disease than to cure it. It is not hard to build up a strong and healthy body and what a satisfaction it is to know that our bodies are strong and healthy. Health gives us the power and the endurance which enables us to ward off and to prevent the occurrence of disease. When one has

health all the organs of the body function normally and in harmony. The respiratory apparatus, the digestive, the circulatory, the glandular, the nervous and the eliminative systems all work together and maintain that proper metabolic balance which does so much to fill one with vitality and energy, and make one feel alive in every sense.

The Time to Learn How to Live Is When One Is Young. If all human beings would learn in their youth to live as they should—to live as Nature intended they should, at forty years of age they ought to expect at least forty years more of a life full of enjoyment and happiness. Many of the most noted personages of this world have done their best work after forty years of age; many of the greatest minds produced their greatest thoughts and teachings after this period in their lives.

The writer, for example, is today, at almost sixty-seven doing more work than he has ever done; his mind is keener, his body just as strong, just as active as when he was a young man; he is alert, alive and is accomplishing more that is worth-while, more that is helpful, than at any previous period in his entire life. And why? Because he has always practiced what he preached and because he has never let down in his own health building activities. He has never advised his followers to undertake anything which he has not himself undertaken in the way of health building measures and the following of the laws of Nature.

Instinct and Reason. Human beings are called creatures with reasoning powers; they are supposed to live as they should because of those powers, because they are

able to reason out the *why* of things. The lower animals live by instinct alone and what they do they do without reasoning. Yet, as stated before, animals, unless killed, usually live out their allotted time while humans nearly all die prematurely. It would thus appear to our shame, that instinct is often better than reason when it comes to obeying the laws of Nature. When a dog or a horse or other animal is sick the first thing he does is to stop eating, to "go off his feed." He fasts and he fasts completely and continues to fast until the condition from which he is suffering is relieved. You may place as much food as you wish within his reach but he refuses it and continues to refuse it until Nature calls for it, which means that he is getting well again, that the toxic condition from which he has been suffering and which is the cause of most illnesses, has been eliminated. He will then eat ravenously or sparingly as his case demands. This is all done through instinct yet he is doing the right thing. He will also drink a good deal of water, aiding elimination and helping to carry off the poisons from his system. He will, if he is a dog, go out into the fields and nose around until he finds certain weeds which he will chew and swallow and which will act as a laxative and clean out his digestive tract. All instinctive but how correct! He will lie out in the sun absorbing its ultra-violet rays; he will remain quiet and relax—and he will get well.

How different is the average human being. When he is ill he will have any amount of food forced upon him and poured into him to "keep his strength up" in spite of the fact that Nature calls for complete rest of his digestive organs and the avoidance of food until all the toxins

have been eliminated from his body. He will be given all kinds of medicine to reduce fever when it is well known that fever is Nature's principal method of killing off and getting rid of poisons in the system. He will allow himself to be shut up in a poorly ventilated bed-room, lying in bed smothered in bed clothing for fear he will catch cold! And he will do all sorts of other things which his common sense should tell him not to do. He may get well, and he may not. And even if he does recover he will be a long time about it and will often be left with some condition of ill-health the result of the improper management of his case.

Such things make us wonder. It makes us sorry for ourselves because we, with all our reasoning powers have not exercised them as well as the animal has exercised its instinctive impulses.

Age Is Not Measured in Years. We should not grow old before our time. We should be hale and hearty well into our eighth decade and should enjoy life to the full. There is a most impressive passage in Robert Browning's poem "Rabbi Ben Ezra." It is as follows:

"Grow old along with me!
The best is yet to be—
The last of life for which the first was made."

That is a beautiful description of what old age should be. "Grow old along with me! *The best is yet to be—*" The best part of our lives should be the latter years. We look back upon our achievements, our successes, perhaps upon some failures—failures which we can now, in retrospect easily account for. We naturally live partly in

the past but largely in the present, for life still holds much for us that is dear, and we live also in the future for with health and vitality still preserved we have no fear of dissolution for some time to come. We can be happy in the memory of the past, happy in the activities of the present, and happy in the anticipations for the future. And we grow old only in years but not in mind nor in body nor in spirit nor in thought. Someone has said "Count your age by friends, not years." This is a happy thought indeed. When one has health the older one grows the more friends will one have. Sickness does not attract, it repels; querulous old age does likewise. "The last of life for which the first was made." Another happy thought. The first part of our lives is lived in preparation for the last. What an incentive to the youth of this land to so live that the latter years of their lives will be the best. "*The best is still to come.*"

Can Life Begin at Forty? Many books have been written on the subject of old age and how to overcome its infirmities. Walter B. Pitkin wrote one called "Life Begins at Forty" in which he shows why the latter part of life should be the best. This is a quite remarkable book and is certainly deserving of its great popularity. However, its author seems to touch somewhat too lightly upon the physical side of the question but that is just the side which we desire to stress, for it is physical fitness as much if not more than any other condition which conduces to long life.

"A woman is as old as she looks; a man is as old as he feels," while a somewhat facetious quip, contains more than a little truth. A woman who is not in good physical

condition never looks anything but sick, in fact an ailing woman generally looks worse than an ailing man. Illness seems to show upon a woman's face more plainly than upon a man's. This may be because a busy man is so occupied with his work that he has little time to dwell upon his infirmities, pushing them aside, and so becomes less self-centered unless his trouble is of such a severe nature as to prevent his attending to his business. In such cases a man is often worse than a woman, and certainly men make worse patients for the doctors to handle. But when a woman is ailing her face shows it in its anxious expression, its drooping mouth, its wrinkles, its pallor, all of which adds years to her appearance.

Of course the old adage has reference to woman making herself look young and so disguising her age to others but we are showing the truth of the adage from another angle. "A man is as old as he feels." When a man is ailing, he, as stated before, tries to put his bad feelings aside, to sublimate them as his business must take his attention. And he is frequently able to forget for the moment his aches and pains. But if he really becomes ill so that he cannot put his illness aside and forget it he becomes old—overnight, if he has to remain away from his office or store, perhaps. He becomes more self-centered than any woman. He worries, frets, becomes depressed, melancholy and pessimistic to the last degree. He looks old and he feels old.

Another old saying which is full of truth is that "A man is as old as his arteries." If a man's (or a woman's) arteries are in good condition it is almost safe to feel that he or she has been living a fairly natural and nor-

mal life and taking at least ordinary care of himself or herself. When a man eats improperly, rushes about too much, gets too little rest and relaxation, constantly worries and frets and is careless about his eliminations he develops a toxemia which is very apt to affect his heart and his blood vessels, and cause the development of such cardiac conditions as chronic myocarditis (inflammation of the heart muscle), angina pectoris (neuralgic spasm of the heart), hypertension or high blood pressure, and thickening and brittleness of the arteries in the body (arteriosclerosis). This latter condition leads to other serious conditions or is produced by them, the kidneys, the liver and other organs of the body are affected, health is lost and finally chronic invalidism or death threatens.

Many People Merely Exist: They Do Not Live. The majority of people go through life without actually living; they merely exist. They go through life mechanically, in a most perfunctory manner, doing their work in a desultory sort of way because they *have* to do it and not because they *want* to do it or enjoy doing it. Of course this is sometimes due to the fact that many persons are engaged in occupations for which they are not really fitted; they have mistaken their vocations, and they do not get the thrill, the incentive out of their work as do those who are following congenial occupations. The majority of people get a certain amount of pleasure in the course of their lives but their enjoyment is not keen, they are neither happy nor unhappy. Their lives are drab; they exist, but they do not live in the true sense of the word.

There is no real reason for this state of things. We

can all be alive, alert, responsive; we can all become imbued with the spirit of life, with enthusiasm, ambition, and the *joy* of living. This is always within our reach. We have but to hold out our hands and grasp the means to this end. But it must be done before it is too late. One cannot wait until the so-called infirmities of middle age come upon one before trying. It must be done *early* in life. Of course even during one's latter years much can be done to restore broken health, to rehabilitate and rebuild, to eradicate disease and induce a condition of soundness but it will take a long time—precious time during which one could have been enjoying health and happiness.

What Is Disease? Disease is an abnormal condition of the body brought on by wrong living. In most cases the responsibility for disease rests upon the individual himself. This means that the remedy lies also in his hands. He has been the one to contract the disease and he is the one to eradicate it. And as disease comes from wrong living habits the remedy lies in the correction of these habits, in giving Nature a chance to do something. And when this is done and a condition of health supervenes one must continue to live properly always, so as to maintain this state of normal health, immune from the ills which are sure to follow the breaking of Nature's laws.

Disease may be either functional or organic. In the former type the function or functions of the organ or organs affected are disturbed but no structural changes have taken place in them and there are no lesions present which can be determined by examination. When the

functions of the affected organs are re-established the disturbing condition disappears.

In organic disease, on the other hand, structural changes take place in the affected organ or organs. These organs become crippled and not only are their functions interfered with but their general anatomy is pathologically affected. When such structural changes have taken place relief or cure is much more difficult of accomplishment; when no such structural changes have taken place results are more speedily and satisfactorily obtained.

Some scientists have raised the question as to whether these two forms ever can exist independently. We know that when structural changes take place functions are interfered with and it is thought by many that interference with functions cannot continue for any length of time without causing some structural change in the tissues. While the distinction between functional and organic disease is commonly made the fact that the above question has been raised is of some interest.

Acute and Chronic Disease. Diseases are classed also as acute and chronic. Acute diseases are those which have, as a rule a more or less sudden onset, are marked by symptoms sometimes quite violent in character, run a rather short course, and terminate favorably in complete restoration to health or unfavorably in death, according to the severity of the disease and the general physical condition of the sufferer.

Chronic diseases are those usually of long duration. The symptoms are not as a rule nearly as violent nor as marked as in acute diseases but chronic disease tends

unless checked, to slow progression, gradually causing more and more structural changes in the affected parts and slowly undermining the system and the general vitality to such an extent that the powers of resistance are markedly lowered. In many cases there is from time to time a temporary improvement with entire or partial disappearance of the symptoms. But this improvement is later followed by a reappearance of the symptoms and further depreciation in the general vitality of the sufferer. Unless checked, relieved, or cured, the patient will become slowly worse until life is ended through the failure of some vital organ of the body or the occurrence of some acute disease which the already depleted system cannot fight.

A third class of disease is what is commonly known as sub-acute disease. In this class recovery is more apt to take place than is the case with chronic disease and this recovery is apt to be more rapid than in chronic ailments which do recover but considerably slower than in cases of acute disease.

Chronic disease often develops as an aftermath of some acute condition which has either been neglected or improperly handled or in which there has been so much general depletion of the system that proper reaction fails to take place and instead of complete recovery there remains a low grade of inflammation which gradually develops into a chronic condition.

It has been aptly remarked that "the time to treat chronic diseases is before they have begun." This, in other words, means that one should so live that chronic conditions will not develop. The medical profession is fortu-

nately now paying a great deal of attention to what is known as preventive medicine, namely the pursuing of methods designed to prevent the occurrence of disease. While among the members of the medical profession this is attempted by the use of prophylactic inoculations and vaccinations physical culture methods accomplish the same results, sometimes more thoroughly, by means of health building measures and proper habits of living. Such measures tend to prevent disease, and this is much better than having to treat disease after it has developed.

Diseases of Middle Age Due Mostly to Neglect. The object of this book is to help those who, unfortunately, have disobeyed the laws of Nature; those who have not in their earlier years lived correctly; those who have paid so little attention to their own machinery that it has been allowed to get out of order. Most of the diseases which develop after forty years of age, barring of course certain acute infectious diseases or diseases brought about by some temporary lapse in one's living habits, are insidious in their nature, creeping upon one like a "thief in the night." They give little warning. They often, from time to time, cause the development of certain symptoms which should be recognized as warnings of what may be expected but these symptoms are seldom taken seriously. And so, the man or the woman is stricken in what should be the prime of life.

It is too late to tell these persons what they should have done in their youth—that time has passed. What we can do however, is to help those men and those women who have fallen victim to any of these so-called degenerative diseases of middle age, the result of early neglect of

themselves. We can help them to get well again and to keep well. In doing this we are also helping them to live longer and more happily, which is indeed their proper heritage. Fortunate it is that much can be done and that even in severe cases relief and often cure can be obtained.

Does Death Begin at 40? Many people still cling to the belief that after one arrives at the age of forty years there begins a general decline in vitality, energy, strength and health and that this decline is natural, constant, and unavoidable. For example there is a Welsh proverb which is as follows: "Better and better till the beard grows; then worse and worse till death." The only comment we have to make on this proverb is that it is probably so ancient that some excuse can be made for it on the ground of lack of knowledge at the time it was written, of the requirements for the maintenance of health, strength, and vitality. In the light of our present knowledge of health building we realize the incorrectness of this adage. Yet many most intelligent people believe this to be true. In fact Dr. Max Rubner as recently as 1908 stated that the bodies of all animals, including man, have each the ability to generate only a fixed amount of energy and that having done that the animal dies. This means that if a man "burns the candle at both ends" and uses up in a shorter time the energy which amounts to that which he can generate, and which he could by careful living have spread over a much larger number of years, nothing is left for him but to die. According to this belief the expenditure of energy in the form of exercise or sustained physical exertion will shorten life and we

must therefore be very careful about such expenditure of energy. This belief is, of course, entirely opposed to the views of modern health builders, who hold that energy can be increased instead of expended by the right kind of exercise carried out in proper manner. Physical culturists do not believe that the human body can generate energy in only a definite fixed amount and when this is used up no more can be created.

It is, of course, recognized that the *useless* expenditure of energy is a bad thing. Unwarrantably violent exercise, or the expenditure of energy to the point of exhaustion will naturally use up that energy more quickly than it can be created. Too much of anything does harm. A certain amount of food nourishes the system properly; too much food even of the proper kind poisons the system.

Diseases Common in Middle Life. There are certain diseases which tend to develop or to become worse after middle age. These diseases are of a degenerative character because from years of abuse the affected organs have developed changes more or less structural in their nature, which changes have come on so insidiously that the victim has no intimation that anything is wrong until suddenly he goes down with a smash. These diseases are commonly those affecting the heart, the arteries and the kidneys.

Physical culture methods have performed miracles in those suffering from these various diseases which have developed after years of poisoning of the system with toxins the result of dietetic and other errors. Where the permanent damage has not been too great natural meas-

ures have proved to be extremely efficacious and have been able to bring health, happiness, contentment and longer life to thousands who without such measures would have filled premature graves.

To those who read these pages let it be said that there is always hope; there is no need for discouragement. All that is required is perseverance, patience and a strong belief that these measures will be of help. Just as one can cause the development of some abnormal condition by constantly having it in mind with a fear that it will develop, so one can also do a lot toward accomplishing a cure of disease by concentrating on it in a constructive way and believing that it will be conquered in time. This constructive thinking together with the adoption of natural, physical culture measures of blood purification and the elimination of accumulated poisons from the system will be productive of good results in the way of improved health, restored energy, and a longer and a happier life.

CHAPTER TWO

Blood Pressure—High and Low

SO MANY of the degenerative diseases of middle age are associated with abnormal blood pressure that it is of interest to know something as to what the term "blood pressure" means. The blood as it flows through the blood-vessels necessarily exerts a certain amount of pressure outward upon their walls. There are several factors which regulate this pressure: (1) The voltage or strength of the heart beat; (2) The amount of blood in the arteries; (3) The elasticity of these arteries. In addition, there is a certain amount of resistance in the capillary system of blood-vessels in which the final arteries terminate and in which the movement of the blood has markedly slowed down. This slowing down is due to several factors, such as the smallness of the blood-vessels, the distance from the initiative force of propulsion, namely the heart, and also because slowing down is more or less necessary in order to give the blood a chance to supply the tissues with their nourishment through the process of osmosis as the passing of fluids through walls and tissues is called.

Any condition which affects the elasticity of the blood-vessels or which narrows their caliber or any condition of the heart which affects its propulsive power will naturally affect the blood pressure. Normal blood pres-

sure is maintained consistently within certain average limits. The blood pressure is measured by means of an instrument, the sphygmomanometer. This instrument is equipped with a band of thin, soft material within which there is a rubber bag. This is wrapped firmly about the arm above the elbow. The rubber bag is then inflated by means of a rubber bulb. A rubber tube connects the rubber bag with the bulb and another rubber tube connects the bag with an appliance consisting of a glass tube at the bottom of which is a receptacle containing mercury. The glass tube is fastened to a board containing a graduated scale. In taking the blood pressure the rubber bulb is squeezed until the artery over which the arm band is placed is so compressed that the pulse below the arm band is silenced. At the same time that the rubber bag is compressing the artery it is also raising the column of mercury in the tube and at the moment the blood is obliterated the reading on the scale beside the glass tube indicates what is called the "systolic" pressure. The person taking the blood pressure meanwhile applies a stethoscope over the artery at the bend of the elbow. The pulse beat will be heard until the pulsation is obliterated and at that moment is registered the exact amount of pressure that is required to produce this effect. The systolic pressure, therefore, denotes the amount of pressure against the sides of the artery during the systole or contraction of the heart.

This having been ascertained, the air is very slowly allowed to escape from the rubber bag through an adjustable valve. As this occurs the pulse beat will again be heard through the stethoscope, but as the pressure is

released the pulse beat will again cease to be heard. Another reading on the scale is taken at this particular moment and this will represent what is known as the "diastolic" pressure. The diastolic pressure denotes the amount of elasticity in the artery and its contractile power after being distended by the systole or beat of the heart. Blood pressure, therefore, is a term used to denote the amount of pressure the circulating blood exerts upon the arteries which causes them to expand and contract as the blood is pumped into them from the heart. Normal blood pressure ranges from 115 to 135 millimeters in adults, and from 90 to 110 in children. As one grows older the normal blood pressure gradually rises up to 40 to 45 years of age. After that, it rises little or not at all in normal cases, although in some cases the blood pressure may go to from 145 to 155 without there being any particular abnormal condition. A blood pressure as high as 160, however, is considered as pathological. Blood pressure varies in various individuals and in the same individual at different times during the day. At night during sleep it is lowest. It is influenced by posture, by the process of digestion, by external changes of temperature, by altitude, by muscular action, and by emotion such as anger and excitement. Blood pressure will rise sometimes as much as thirty points or even more under some of these stimuli but will rapidly subside when the stimulus is removed. A blood pressure slightly below normal need occasion no alarm. There are many persons who normally have a low blood pressure and still are in good health. However, blood pressure which is abnormally low, may be considered as pathological—indicating disease.

Pulse Pressure. Pulse pressure is the difference between the systolic and the diastolic blood pressure. For example, if the systolic pressure is 130 and the diastolic pressure is 80 the pulse pressure is placed at 50.

High Blood Pressure. High blood pressure, or what is known as hypertension, may occur in many diseases, especially arteriosclerosis, interstitial nephritis (a certain form of Bright's disease), angina pectoris, diabetes, eclampsia (convulsions usually of kidney origin), apoplexy, uremic poisoning, lead poisoning, toxemia and some forms of nervous tension. Low blood pressure or hypotension occurs in infectious fevers, in some forms of arteriosclerosis, accompanied by heart weakness, anemia, general debility, some cases of diabetes, shock and collapse, exhaustion of the adrenal glands, chronic tobacco poisoning and hemorrhage.

High blood pressure as a rule, is found in persons of middle age, though it is occasionally also found in younger persons. When it occurs it is usually because of a general toxic condition which has caused disease of some of the important organs or structures of the body. In order to treat high blood pressure properly one must ascertain the exact cause as to try and reduce it without removing the cause is often a dangerous procedure. For example, in Bright's disease a high blood pressure is necessary in order to enable a sufficient amount of blood to pass through the kidneys and an attempt to reduce the blood pressure in such a case without detoxifying the body and attempting to restore some of the elasticity to the blood vessels might be productive of serious results.

Treatment of High Blood Pressure. It is of importance then in order to reduce a high blood pressure to establish a process of elimination. In attempting to reduce a high blood pressure it is advisable to begin by subjecting the patient to a short fast or a short fruit juice diet or fruit diet. Whether it be a fast or a fruit juice or fruit diet depends largely upon the general condition of the patient. If there is present a great deal of general debility or nervous tension the fruit juice or fruit diet is probably better than the fast. A good fruit diet may consist of three meals as follows:

In the morning: One grapefruit, two or three steamed figs.

At noon: One apple and three or four dates.

In the evening: One pear and one banana.

One may vary juicy fruits and sweet fruits from day to day. During the fast or the fruit or fruit juice diet a daily warm enema is to be taken. After the fast or the fruit or fruit juice diet has lasted three or four days an exclusive milk diet or a milk and fruit diet may be given to advantage. When there is arteriosclerosis present, however, one must be careful not to take very much milk and for an ordinary sized person not more than four quarts of milk should be taken daily when on an exclusive milk diet. When on a milk and fruit diet one takes from three to five pints of milk daily in addition to the fruit. Salad diets are also very satisfactory and generally quite acceptable. A good sample salad diet including two meals a day is as follows:

Breakfast: Juicy or sweet fruit salad, with or without milk.

Evening: A large green salad with raw root vegetables, such as grated carrots, with or without milk or buttermilk.

Another very good salad diet consists of three meals a day as follows:

Breakfast: Fruit as desired, with or without milk

Noon: A green salad with eight ounces of sour milk.

Evening: A green salad with sweet fruit and sour milk, if desired.

After this restricted diet has been discontinued, a general diet, which must be very moderate in amount, may be resorted to. One must be particularly careful not to overeat but should rather take less than there is inclination for. A good general diet will include fruits, fruit juices, milk, vegetables both raw or cooked, nuts and a few cereals. Meats, fish, eggs, poultry, salt, tea, coffee, and alcohol are forbidden. The use of tobacco should also be prohibited. One must be particularly careful as to sexual indulgence in moderation and one must avoid worry and over-activity. Exercise in the form of walking is of great benefit, although it must not be overdone. When one cannot take regular exercise passive exercise, given by an attendant, is of value.

When the blood pressure is very high it is well to remain in bed until it has been sufficiently lowered to make it safe to be up and around. Water, externally and internally, and other treatments are used, as in cases

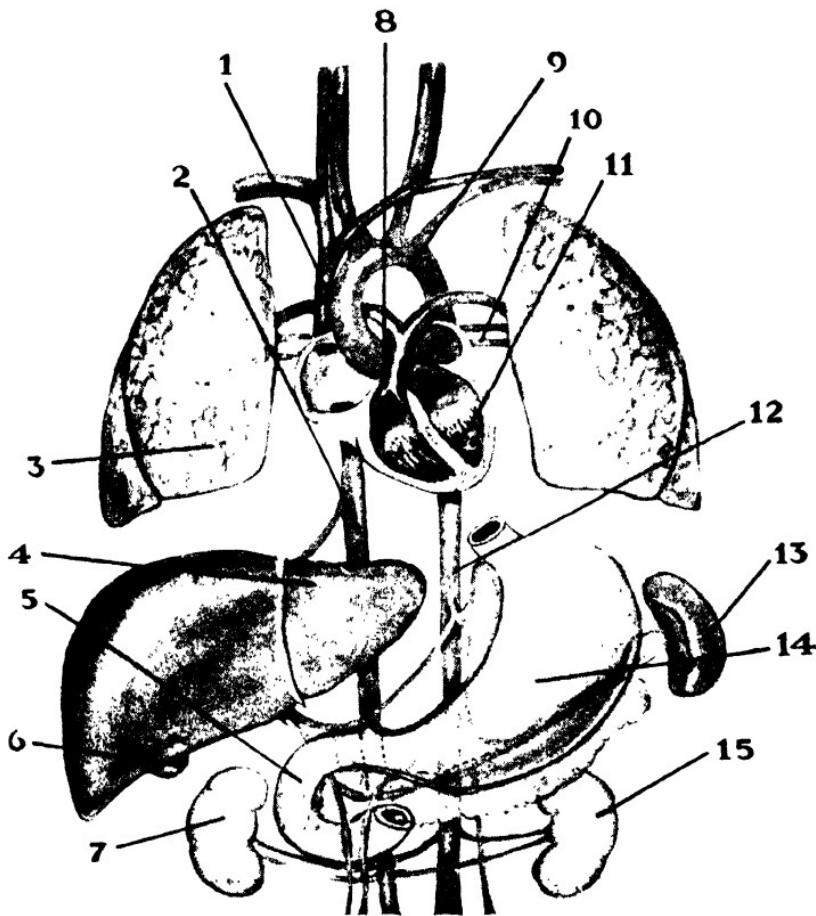
of arteriosclerosis, and the reader is referred to later discussion of that disease for further information.

Low Blood Pressure. A blood pressure slightly below normal may, as before mentioned, occasion no particular alarm, but a persistent very low blood pressure is pathological and may denote existence of various abnormal conditions. Low blood pressure means diminished reserve power of the circulation, heart weakness and perhaps arterial hardening, chronic Bright's disease, or arterial spasm. It may also be associated with exhaustion of the adrenal glands and may be found in severe toxemias and infections following such conditions as typhoid fever, influenza, and pneumonia. It is often present in tuberculosis and in diabetes mellitus. Persons affected with chronic tobacco poisoning are frequently found to have a low blood pressure, and naturally persons who have suffered a considerable loss of blood, although suffering from anemia, will have a low blood pressure.

Treatment of Low Blood Pressure. In attempting to overcome low blood pressure it is quite necessary to ascertain the exact cause and to take steps to remove it. When the cause is removed the condition will generally improve very materially and within a reasonable length of time. If low blood pressure is due to degeneration of heart muscle rest is most important, although such exercise as walking in moderation is usually allowable. One must be particularly careful about walking up steep grades and also about climbing stairs. If low blood pressure is not due to heart weakness moderate exercise in the form of calisthenics is often of value but must not be carried beyond the point of slight fatigue. Daily warm

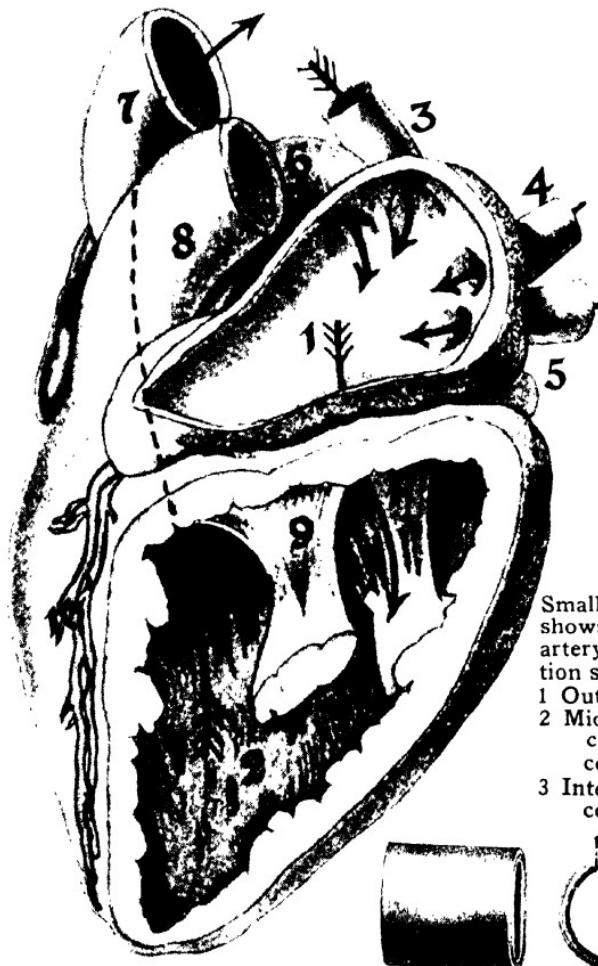
baths or tepid baths followed by cold showers or sprays are of value if the reaction is good; if not, the cold shower or sponge may have to be omitted from the treatment. The bath is followed by body massage or friction. Sometimes a needle bath or a percussion bath is of considerable value.

As to the diet, fruits and vegetables are highly recommended. Such a diet for a few days may be followed by a milk diet to advantage. Later on a diet which besides fruit and vegetables and milk may include some whole grain cereals, a few nuts and dried fruits as well as cottage cheese, with honey used for sweetening purposes, is to be recommended. In some cases, a little meat is allowable but it is not actually a necessity. If taken, it should be small in amount and should be taken not more than once daily. Constipation is of course to be avoided by means of exercise, and the eating of leafy green vegetables containing bulk in the form of cellulose. In addition, abdominal massage is a great help as well as the use, if necessary, of mineral oil or agar agar or the taking of an occasional enema or a high colonic irrigation. Rectal dilatation seems to be of considerable value in cases of this kind, and occasionally a high frequency electric current may be recommended. In cases of exhaustion of the adrenal glands the giving of adrenal extract is often very effectual but this should not be used except upon the advice of a physician as the indiscriminate or improper administration of glandular extracts may do considerable harm.



**ORGANS AND BLOOD-VESSELS WHICH MAINTAIN
VITALITY AND LIFE**

- | | |
|----------------------|----------------------------|
| 1 Vena cava superior | 8 Pulmonary artery |
| 2 Vena cava inferior | 9 Aorta |
| 3 Right lung | 10 Pulmonary veins |
| 4 Liver | 11 Left ventricle of heart |
| 5 Duodenum | 12 Descending aorta |
| 6 Gall bladder | 13 Spleen |
| 7 Right kidney | 14 Stomach |
| 15 Left kidney | |



Small illustration below shows a side view of a artery, also cross section showing three coat
 1 Outer or cellular coat
 2 Middle or muscular coat and fibrous coat
 3 Internal or epithelial coat



**ABOVE APPEARS A SECTIONAL VIEW OF HEART
SHOWING CHAMBERS OF LEFT SIDE**

- | | |
|--------------------------|----------------------------------|
| 1 Left atrium | 7 Aorta |
| 2 Left ventricle | 8 Pulmonary artery |
| 3 }
4 Pulmonary veins | 9 Mitral valve |
| 5 } | 10 Left coronary artery and vein |
| 6 } | |

CHAPTER THREE

Your Heart in Middle Age

OF THE severe diseases with which men and women of middle age are often affected, heart disease is the most common. While hypertension and arteriosclerosis are extremely common diseases it will generally be found that in these conditions there is also some heart complication present. In the various forms of nephritis or kidney disease the heart will also be found to be affected in a large percentage of cases. Chronic, constitutional disease of the kidneys interferes with the normal circulation of the blood, impeding it and putting more strain upon the heart, causing it to over-act and work harder than it normally should, with the result that in time it becomes itself affected. This is all in addition to those cases of heart trouble which are disassociated with diseased conditions of any other vital organs so that it may, we believe, be safely said that the heart in some way or other is more often affected in persons of middle age than any other organ of the body.

The Heart the Most Vital Organ. It has been said that the heart is the most important of the vital organs. Some may be inclined to question this as certain other organs of the body are vital organs and are so known because they are absolutely necessary to life. There are some organs of the body which can be removed in part

or even in their entirety and one will go on living. But the heart cannot cease to beat without causing death. One may live with one kidney; a good part of one or even both lungs may become useless for breathing purposes and yet one can live; the stomach can be removed and death will not follow. But the heart can be interfered with but very little without causing almost instant death. So it is undoubtedly one of the most vital of all of our organs in that it will stand but little tampering with.

To be sure, it can take a good deal of abuse. It will go on beating year in and year out when it is overstrained and over-worked, when its tissues are poisoned and when no thought is given to its care. It is one of the most faithful of the body organs. Abuse the stomach and it rebels; abuse the liver and it soon shows signs of irritation and inflammation. And so with most of the internal organs, but not the heart. The heart will take a great deal of abuse before it rebels. It is a powerful organ, not under the control of the will. Nature has given it certain work to perform and it goes on performing it. But even the heart can stand just so much abuse and no more and when it has taken all the abuse it can stand it too begins to fail and when it goes bad it is a very difficult thing to set it right again for it cannot rest entirely as can other organs of the body. It must keep going to pump blood to the tissues to keep them alive and to rebuild them. The only real rest the heart gets is in the brief period between its contractions. That is but an extremely short space of time, yet Nature has so arranged matters that even that short rest period is suf-

ficient to keep the heart in a normal state and functioning perfectly, provided nothing happens to disrupt its rhythm or the rest period, or which puts too much extra work upon its muscles.

And just because the heart can be subjected to a great deal of abuse before it fails in its work, it will often go along until middle life before it shows signs of flagging or becoming diseased even though it may have been neglected and over-worked for many years.

Looking Backward and Looking Ahead. If our foresight were only as good as our hindsight we would be able to arrive at middle age and continue to live on to a ripe old age with all of our organs and all of our faculties functioning normally. "If I only had my life to live over again!" "If I had only known—." How often do we hear this? And just because of all this—just because everyone should know what will happen when one's body is neglected and abused—just because of these things this book is written.

We can point the warning by describing the things which can and do happen in middle life due to early neglect. We can even help those to whom these things have already happened. Our ambition is also to help men and women to keep these things from happening in the future by making them understand that this can so easily be accomplished by living in a manner in which they should. One has sometimes to be cruel to be kind. One has often to depict the terrors of disease in order to impress some people with the importance of correct living which will prevent these diseases from appearing, or which will overcome them if they do appear.

Many things can be accomplished only by inspiring fear in a person. This, however, should not have to be so in the matter of health. One should not have to be frightened into doing the right things. Abuse of the body brings disease; disease brings fright—and a mad rush for relief but often this rush comes too late.

Value of Nature's Methods. Luckily, however, Nature's powers border on the miraculous. Nature can accomplish what drugs can never accomplish. Thus, even when chronic conditions arise they can be helped, they can be relieved and they can very frequently be cured by natural common sense physical culture methods, even though they may be thought to be beyond repair. And it is a blessing that this is so; it is a blessing indeed that we have at hand means to help those who have neglected themselves so cruelly in early life, to suffer and break down in middle life. And so these heart conditions can be helped. It often takes a considerable amount of time but results can be obtained by perseverance and faithfulness in the following out of the natural methods herein described.

Anatomy and Physiology of the Heart. The heart is a very powerful double pump and it is the most remarkable example of muscular activity in the body. In brief, the heart is a hollow, muscular organ, situated in the chest between the right and the left lung. It is of cone-shaped form, and about the size of a closed fist, about 5 inches long, $3\frac{1}{2}$ inches wide and $2\frac{1}{2}$ inches thick. It lies in the chest with its base upward and to the right and its apex pointing downward and to the left. It is suspended in a membranous sac, the pericardium, which is com-

posed of a double layer of membrane. The heart is suspended in this sac in such a manner that it can contract and expand without interference and without friction. It is composed entirely of involuntary muscular fibers, that is, muscular tissue which is not under the control of the will.

The interior of the heart is divided by a vertical partition into two sides, the right and the left. These two sides are again divided by horizontal partitions, each side into two chambers, an upper and a lower. The upper chamber is called the atrium or auricle, and the lower chamber is called the ventricle. There is an opening in the floor of each atrium immediately above each ventricle and each opening is guarded by a valve. The object of the valve is, in allowing the blood to pass from the atrium into the ventricle, to prevent its return to the atrium. If there is any disease of the valves present this function is interfered with and it constitutes a condition called valvular disease of the heart. This will be described later.

There are thus four cavities in the heart, the right and the left atrium, and the right and the left ventricle. The right atrium receives the blood from the veins of the body through two large veins called the *venæ cavæ*. Blood passes from the right atrium through the opening in its floor into the right ventricle, whence it is discharged into a large artery, the pulmonary artery. The opening in the floor of the atrium is protected by a valve to prevent the back-flow of blood into the atrium.

At the point of entrance of the pulmonary artery into the right ventricle there is another valve made up of

three small leaves and to which is given the name of the semi-lunar valve. The pulmonary artery carries the blood to the lungs to be oxygenated and to discharge certain impurities including carbon dioxide which are expelled in expiration. The blood is then returned from the lungs to the left atrium of the heart through the large pulmonary veins and from the left atrium, it passes through the valve in its floor into the left ventricle, thence going into the large trunk artery, known as the aorta, which opens into the left ventricle and is protected by another set of semi-lunar valves similar to those protecting the pulmonary artery. There is a valve situated in the floor of the left atrium which serves to prevent the flow of blood from the left ventricle back into the atrium when the heart contracts.

The blood, after passing from the left ventricle into the aorta is distributed to the tissues throughout the body. The blood is pumped into both the pulmonary artery and the aorta by a contraction of the heart muscles called the systole of the heart. This is popularly known as the heart beat. The average number of contractions or heart beats is in men about seventy-two to the minute, and in women from seventy-six to eighty. In old age with a normal heart the rate is apt to slow down to about sixty per minute.

The Coronary Arteries are small blood-vessels which carry blood to the muscular tissue of the heart for its nourishment. The heart is supplied by nerves from the sympathetic nervous system and from branches of one of the cranial nerves.

Valves of the Heart. The valves of the heart are four

in number as already mentioned. The valve between the right atrium and the right ventricle is composed of three segments and is called the tri-cuspid valve; that between the left atrium and the left ventricle is composed of two segments and is known as the mitral valve. The valves at the entrance of the pulmonary artery and the aorta are, as before mentioned, known as semi-lunar valves and each is composed of three segments. These valves when acting normally prevent the return of blood to the chambers from which it has just been pumped.

The Heart Beat. The contraction of the heart is called the systole. This contraction produces a sound when the apex of the heart comes in contact with the chest wall. This is known as the first sound of the heart. It is immediately followed by another sound known as the second sound which is caused by the closing of the semi-lunar valves. The tri-cuspid and mitral valves close with the contraction and the first sound of the heart. The period between the contractions of the heart is called the rest period or the diastole.

Important Points in Diagnosis. In diagnosing various conditions which are apt to affect the heart in middle and old age there are several things which it is most important to know. There are, it is to be remembered, many types of heart disease, those most apt to develop in middle age being diseases of the heart muscle and disease of the coronary arteries. It is these small coronary arteries which directly supply the heart muscle with blood and keep up the nourishment of that organ. There are other heart conditions which are very apt to develop earlier in life but which do not cause serious symptoms

in many cases until middle life. Prominent among these are the several different types of valvular disease of the heart.

There are certain points which must be studied when the heart is affected—points of the greatest importance because they are often characteristic of certain specific cardiac conditions which it is necessary to differentiate between because the methods of treatment are more or less influenced by these conditions.

Pulse. To the ordinary layman the pulse is just a regular throbbing of the arteries in time with the heart beat and can be felt most readily at the wrist just below the base of the thumb, but the pulse is one of the very important things to study in heart conditions for its character will give a strong indication of the way in which the heart is doing its work and also as to the condition of the artery itself.

In studying the pulse one has to know many things, such as (1) its frequency; (2) its force; (3) its regularity; (4) its quality, that is to say, whether it is full or strong or weak or compressible; whether it is wiry, long-sustained or short; whether the beat subsides slowly or rapidly; (5) the size and feel of the artery as to whether it is hard or soft or larger or smaller than it should be; (6) the existence of double or extra beats.

It will thus be seen that in this one process alone there is a great deal which can be learned because the pulse is practically a reflection of the heart's work and although arterial disease might affect the feel of the pulse, the general character of the heart beat is of great value as an in-

dication of the normal or abnormal condition of the heart itself.

Diseases of the Heart. There are many diseases of the heart, both acute and chronic. All of these will not of course be described in this book, but only those developing commonly in or after middle life, which are the result of improper living habits in earlier life.

For example, there are diseases of the pericardium, this being a membranous bag in which the heart lies within the cavity of the chest. Inflammation of the pericardium or what is known as *pericarditis* is a fairly common disease. It may exist as a primary disease but this is rare. It is usually secondary to infectious disease and to some other general diseases. There are several types of pericarditis which it is unnecessary to describe herein.

Then there is *dropsy of the pericardium* in which there is accumulation of fluid in the pericardial sac. This condition is a fairly serious one but is more apt to be acute in nature.

Myocarditis or inflammation of the heart muscle, is one of the diseases which commonly develops during or after middle life. It is one of the most important of all lesions of the heart. It appears in both the acute and chronic form. The latter is, however, the form in which it is usually found in persons of middle and advanced age and it is the form which will be herein described.

Enlargement or *hypertrophy* of the heart is really a symptom of some other heart lesion, rather than a specific disease and it is present after middle life in an exceedingly large percentage of people.

Dilatation of the heart, a most important and often

extremely serious condition, is also commonly found after middle age in connection with other heart lesions. Fatty degeneration of the heart found in cases of impaired nutrition, prolonged anemia, alcoholism and certain forms of poison is also a serious condition which, however, is not a disease characteristic of middle age, although when it develops from impaired nutrition or chronic alcoholism it frequently does not manifest itself until that period in life.

Coronary thrombosis or obstruction of a branch of a coronary artery is usually associated with angina pectoris and sclerosis or hardening of the coronary arteries. This disease is most frequently found between the ages of forty and sixty, and is described in later pages.

The cavities of the heart are lined with a thin membrane called endocardium. An inflammation of this membrane is known as *endocarditis*. This condition may be either acute or chronic and may be either of bacterial or non-bacterial origin. This disease, however, may develop at any period of life and the chronic form generally follows an acute attack which in turn is induced by some toxic condition such as rheumatism or chorea or some infectious disease. In addition to the diseases above mentioned, there are several valvular conditions, all of which as a rule, are very chronic in their nature and each variety of which produces some variation in symptoms.

The valves of the heart have been previously described. There are, as we have stated, two sets of semi-lunar valves, the aortic and the pulmonary. There is also the tri-cuspid valve which is located between the right atrium and the right ventricle and the mitral valve which is lo-

cated between the left atrium and the left ventricle. These valves may undergo structural changes to such an extent that their function is seriously interfered with. These changes cause in one instance a condition known as *regurgitation* or *insufficiency*, in which the leaves of the valve cannot close tightly enough, thus allowing blood to regurgitate into the heart chamber from which it has just come. Another condition of the valves is known as *stenosis*. In this condition there are deposits formed around the orifice which the valve protects and in some cases the leaves or segments of the valves may be attached at their margin instead of being free, thus leaving a sort of funnel-shaped opening which allows the blood to pass out of the heart chamber before its proper time in the rhythmic heart cycle.

The Rhythmic Heart Cycle. The rhythm of the heart beat consists of a first sound, a second sound and a rest period. The first sound is made at the time the heart muscle contracts. This contraction causes the apex of the heart to impinge against the inner side of the chest wall. The contraction, as mentioned above, is known as the systole. The second sound of the heart is caused by the closing of the aortic and pulmonary semi-lunar valves. The rest period is the quiet period between the second sound of the heart and the following or first sound. This period is known as diastole.

Angina Pectoris. This is another heart condition which is very apt to appear after middle age. It is caused as a rule, by sclerosis of the coronary arteries and will be described later. There are certain conditions of the heart which are congenital, that is, they are present at

birth, but of these conditions nothing need here be said as it is outside of the scope of this volume.

There are also several other functional and organic conditions of the heart which will not be described, they not being concerned with the period of life of which this book treats. Those abnormal conditions of the heart which do not as a rule appear until after forty years and which are caused by toxemias, usually of years standing from improper eating, together with such other conditions as overwork, occupations or habits which put too much of a strain upon the heart, worry, focal infections and intoxications are: angina pectoris, chronic myocarditis, coronary thrombosis and cardiac failure. There are, however, one or two diseases which, while occurring at almost any age, are apt to be found either just developing or at least just discovered during middle age. These are such conditions as *heart block, valvular disease, hypertrophy and dilatation*.

Neuralgia of the heart, breast pang and sterno-cardia are some titles commonly applied to angina pectoris. It receives its popular name because of the peculiar character of the pain incident to the disease. As a matter of fact, angina pectoris is not a true disease but a sort of complexus of symptoms or syndromes in which there are paroxysmal attacks of characteristic pain, to be described later. In addition to the pain the person affected is overcome with anxiety and with the fear of impending death. It seems unfortunately to be a fact that angina pectoris is on the increase at the present time. This is unquestionably due to the strain of business and professional life in this present age. It is not nearly as preva-

lent in rural districts as it is in the cities, probably because ordinary methodical physical labor is less conducive to its development than the rush and hurry, the worry and strain of men and women occupied in the more intellectual pursuits and necessitating more mental strain. It is apparently much more prevalent among the intellectual than it is among the laboring classes, being most frequently found in educated and emotional people. Jewish peoples are fairly susceptible to angina pectoris. It is said to be very rare among the negro race. This so-called disease has a high mortality, incidentally, among city dwellers. It is much more common in men than in women, the percentage being claimed by some as being about four to one, and it is more common after the age of forty or forty-five than before that time.

Cause of Angina Pectoris. As to the cause of angina pectoris many theories have been advanced. As a matter of fact the exciting cause is generally a lack of nutrition of the heart muscle. This lack of nutrition may be caused by diseases of the coronary arteries, the small arteries which supply the heart muscle with nourishment. Sclerosis or thickening or hardening of these arteries will so contract and narrow their caliber as to prevent sufficient blood reaching the muscular tissues of the heart. This will bring on a heart spasm and interfere with proper heart action.

Physicians rarely appear to attribute the disease to a general systemic toxemia, the result of improper living habits, except to acknowledge that overwork, worry, etc. are factors in the development of the disease. Yet it is undoubtedly true that angina pectoris develops largely in

those persons who have not lived a normal life but who have been addicted to worry, haste, irregular meals, hurried eating, overeating, loss of sleep and perhaps the use of alcohol and tobacco, all of which tend to induce a general systemic toxemia and predispose to structural changes in the arteries and otherwise put the system in such condition as to render it susceptible to such diseases as angina pectoris.

It would therefore seem one of those diseases of middle life which is entirely preventable by proper living during one's earlier years. Even after it has been developed, however, much can be done toward its relief or arrest by adopting proper living habits and getting rid of any existing focal infection and by eliminating accumulated toxins from the system.

Structural Changes in Angina Pectoris. There are certain structural changes which are found in this disease. These are sclerosis or hardening of the coronary arteries or the presence of *atheroma* or degeneration of the walls of these arteries. Sometimes there is an entire obliteration of their caliber. Attacks of anginal pain have however occurred when none of these conditions are present and, on the other hand, such conditions may develop and produce no attacks of spasmodic pain.

Symptoms of Angina Pectoris. The principal symptom of angina pectoris is the sudden occurrence of intense and agonizing pain, beginning in the region of the heart and extending to the neck and down into the left arm. In addition to this paroxysmal pain there is generally more or less shortness of breath and a feeling of heaviness or pressure beneath the breast bone. The vic-

tim often fixes his chest muscles rigidly, stands perfectly still or sits down, his hand being pressed against his chest. The face becomes exceedingly pale, sometimes almost greenish in hue, the expression is very anxious and there is a fear of impending death. A cold perspiration breaks out all over the body. The attack lasts as a rule, only a very short period of time, a few seconds to a few minutes, but it produces a condition of extreme exhaustion. As the attack passes away there is frequently the eructation of more or less gas from the stomach. Sometimes vomiting will occur and there is usually a large amount of urine voided shortly after the attack. These spells are extremely serious and while many persons who suffer from angina pectoris may have repeated attacks it is always possible for the very first attack to prove fatal.

There is another condition which is known as *pseudo angina* or *false angina*. This is not as serious as the form known as true angina. False or pseudo angina attacks come on gradually with more or less abdominal distension, restlessness, a flushed face instead of a pale face, a rapid, irritable pulse, pain beneath the breast bone covering a fairly wide area, and extreme nervousness. False angina is practically only a symptom resulting from some disturbance of the nervous system or of the digestive tract as the result of imperfect nutrition or the excessive use of such articles as tea, coffee and tobacco.

In differentiating true angina from false angina other conditions producing precordial or pains beneath the chest bone, one must remember that in true angina pectoris the attacks come on very suddenly, the pain in the chest is agonizing in character, radiating down the left

arm and that they last but a few seconds but that the prostration induced often lasts for several days. False angina, acute indigestion, neuralgia of the nerves lying along the lower borders of the ribs all may simulate the pain of true angina and must be differentiated from that condition. There is a mild form of angina pectoris in which there is pain beneath the breast bone but it is not as severe as in the other form. The attacks come on during excitement or exertion and serve as a warning to immediately relax and remain quiet for a time. There are several points to be taken into consideration in differentiating true angina from false angina. Huchard tabulates them as follows:

True Angina	False Angina
Most common past middle life.	Occurs at every age, from six years up.
Most common in men.	Most common in females.
Attacks rarely occur at night and rarely periodical.	Often occurs at night and often periodical.
Not associated with other symptoms.	Associated with nervous symptoms.
Agonizing pain and sense of constriction.	Pain less severe; distension more than constriction.
Pain of short duration.	Pain lasts for one or two hours.
Lesions of arteriosclerosis.	Neuralgic affection.
Prognosis grave.	Never fatal.

While, as stated above, the outlook in true angina is grave, yet it is not to be considered as hopeless by any means. Much can be done for its relief and amelioration and by following proper living habits the disease will often be kept under control.

Treatment of Angina Pectoris. The natural treatment of angina pectoris resolves itself into the treatment of the attacks and treatment in the intervals. The immediate treatment during an attack must be prompt and continued until relief occurs. As soon as an attack begins the patient must *at once* lie down or recline in a large easy-chair. Hot compresses are placed over the chest and over the abdomen. The drinking of two or three glasses of hot water is advisable. If sufficient relief is not obtained by the use of hot compresses the alternate application of hot and cold compresses may be tried, putting on the hot compress for three minutes and the cold compress immediately following for one minute, keeping up the practice until relief is obtained. These alternating hot and cold compresses have a very powerful stimulating effect upon the circulation and as a rule, prove very effective.

Angina pectoris sufferers must keep the large intestine clean at all times. This can be accomplished by the use from time to time of enemas and high colonic irrigations. Short fasts, repeated at frequent intervals, are of considerable value. If the general condition is very weak, fruit diets may be substituted for the fasts, these diets to last for about three days each time they are taken. The fruit diet can well be instituted once every three or four weeks to advantage. Persons in good general condition can

often take a long fast, lasting ten or twelve days. During any fast, either long or short, a daily enema is to be taken and considerable pure, cool *but not ice cold water*, is to be drunk. After a long fast it is a splendid thing to adopt an exclusive milk diet for several weeks. If this tends to put too much weight on a person or if one is overweight before beginning the fast, skim milk or buttermilk may be taken. As there is often an arteriosclerosis present, the amount of milk taken must not be too large and as a rule, four quarts daily will be a fairly safe limit. After a fruit diet or after discontinuing the milk diet one should live largely for a long period of time upon a very simple diet of low starch and other chemical content. This limited diet must be persisted in for many months.

It is important to keep a little below normal weight. This should always be kept in mind. Overweight is a bad condition but especially so when the heart is affected, and more especially in cases of angina pectoris. Dr. Donald McCaskey claims that flesh weight instead of being an indication of health as some think, is really just *sewage* weight that is constantly poisoning the tissue cells and which has probably been poisoning them for years. Because of this continual poisoning of the flesh cells, angina pectoris symptoms finally appear. It is of no avail for the sufferer to compromise to regain health and to preserve life. Therefore, a strict diet is essential to the proper treatment of this condition. A diet, limited to those foods containing no more than from five to fifteen percent of carbohydrates is therefore essential until the patient has lost from twenty pounds up to as much as sixty pounds

in persons who are considerably overweight. Weight reduction to or below normal is absolutely essential. This gives the excessive sewage an opportunity to be gotten rid of during the fasts and the restricted diets. The following fruits and vegetables contain not more than fifteen per cent starch in each instance.

Apricots	Cucumbers	Pears
Apples	Egg Plant	Green Peas
Artichokes	Endives	Green Peppers
Asparagus	Fresh Currants	Pimento
Avocado	Huckleberries	Pineapple
String beans	Kale	Pumpkin
Beets	Kohlrabi	Quince
Beet Greens	Leeks	Radishes
Blackberries	Lemons	Rhubarb
Blueberries	Lettuce	Rutabaga
Brussels sprouts	Mushrooms	Sauerkraut
Cabbage	Muskmelon	Savita
Cantaloupe	Okra	Spinach
Carrots	Olives (ripe)	Squash
Cauliflower	Onions	Strawberries
Celery	Oranges	Tomatoes
Chard	Parsnips	Turnips
Cranberries	Peaches	Turnip Greens
	Watermelon	

When improvement has taken place the diet can be increased somewhat by the addition of other vegetables and also milk, cottage cheese, small amounts of whole grain products, an occasional egg and coffee substitutes.

Meat, fish, and poultry should be avoided as well as spices, condiments, tea, coffee, alcohol and tobacco.

Exercise. Exercise has to be very limited in amount in many cases of angina pectoris, at least until marked improvement is noted. Many patients who have just passed through the crisis of a severe attack have to remain in bed for several days. They have to be kept extremely quiet. If they want their position in bed changed it is to be done by an attendant or by some member of the family. Later on mild exercises can be taken in the form of walks which are at first to be very short and taken at a very slow pace. The length of the walk and the pace may gradually be increased as conditions improve. At first walking on level ground is all that is to be allowed. Later on, this may not be so essential although climbing hills or going over rough and uneven roads is to be avoided. Deep breathing exercises are also beneficial in many cases.

Other Important Measures. One should remain in bed at least ten hours at night and should be extremely careful to rest for short periods and not to over-exert one's self at any time during the day. All physical effort, excitement, fits of temper, worry, emotion and sexual indulgence should be avoided. One should never take food or drink which is very cold. It is necessary to be careful about going out into an extremely cold atmosphere from a warm room. When this has to be done one should stand for a short space of time in the open before attempting to walk. This allows adjustment of the heart's action and the circulation. It is not advisable to attempt to walk against a strong wind.

The bowels should be kept in good condition and constipation is to be avoided, as straining at stool is very apt to bring on an attack. Sometimes the use of diathermia has a very beneficial effect but electrical measures of any sort should not be applied, except by direction of a physician and then should only be given by a competent person. The sinusoidal current, in particular, should never be applied to the heart in cases of angina pectoris. Infrared irradiation is often of value, applied for from fifteen to twenty minutes over the region of the heart. Many cases seem to be helped by rectal dilatation, and spinal percussion of the seventh cervical vertebra is often of considerable help.

Living an even, quiet life, free from excitement, in a warm and dry climate, with no cares or worries would be ideal for angina sufferers. This can, however, be accomplished so seldom that one must follow Nature's laws as closely as possible and live as nearly an ideal life as one can and improvement will be sure to follow. Cases of pseudo or false angina practically will be cured entirely by adopting measures to build up the nervous system and improve the general physical and mental tone.

Coronary Thrombosis. Coronary thrombosis is an obstruction of a branch of a coronary artery, one of the small blood vessels supplying the heart muscle with nourishment. The obstruction is usually due to a blood clot or what is known as thrombus. Thrombosis is generally associated with a diseased condition of the lining membrane or inner coat of a coronary artery. This diseased condition may be localized within the coronary arteries or may be part of a general arteriosclerosis.

Coronary thrombosis occurs more frequently in men than in women and is most frequent between forty and seventy years of age. Arteriosclerosis is a strong factor in the development of this disease. The condition is also often associated with angina pectoris. In patients suffering from coronary thrombosis there seems often to be a hereditary tendency to high blood pressure.

When the clot formed is of sufficient size to block the coronary artery it produces very severe pain in the heart, resembling that felt in attacks of angina pectoris. The pain is often, however, referred to the lower end of the breast bone or the upper part of the abdomen and symptoms which simulate gastric disorders frequently develop such as nausea and vomiting. The difference between the pain in angina pectoris and in coronary thrombosis is that in the former disorder the pain usually lasts for an extremely short period of time while in the latter it may continue for many hours. It is not brought on by exercise or exertion as is sometimes the pain of angina pectoris. The attacks, however, come on suddenly and the patient is very apt to go into a state of collapse and shock. A low form of fever usually develops. When the attacks occur the heart action is greatly increased in frequency, there is loss of the heart rhythm, the pulse becoming more or less irregular. At the beginning of the attack the blood pressure may be found to be quite high, but after a few hours it generally becomes much lower. In rare cases occlusion of the coronary artery occurs from the thickening of its walls to such an extent as to prevent the passage of blood.

In cases of coronary thrombosis the heart is generally

more or less enlarged, though the voltage may be greatly reduced and the apex beat may be weak. The result of the plugging of a coronary artery is that the blood is prevented from reaching the tissues of the heart which the artery is supposed to supply and as a consequence, there occurs what is known as an infarction. This means that the small area of tissue which has been deprived of its blood supply often becomes necrotic and dies. Sudden changes may now take place in these heart tissues, producing symptoms which, if not properly recognized, may lead to serious consequences.

These changes may consist in the formation of blood clots over the infarction within the ventricle of the heart, and pieces of these clots may break off and be carried in the circulation to other portions of the body, plugging up other arteries, such as the cerebral arteries in the brain or some of the arteries in the lungs. This is a very dangerous complication. Rupture of the ventricle of the heart sometimes occurs of course with fatal results. Fibrillation or fluttering of the atrium (the auricle) of the heart is a common condition as also is rapid contraction of the ventricle of the heart. Many persons who are thought to have died from what has been called acute indigestion have really been the victims of this and other acute heart crises. If recognized early and treated properly this condition may be completely healed but if unrecognized or if improperly treated, death may result.

Treatment. When an attack of coronary thrombosis occurs absolute mental and physical rest is imperative. The patient is at once put to bed and made as comfortable as possible in the position which gives the most ease.

Many people suffering from acute indigestion want to walk about. This is very bad in cases of coronary thrombosis. Therefore, a correct diagnosis is of importance. The treatment is not at all heroic in these cases. It consists principally in complete relaxation for the patient. In this way the heart will slow down somewhat, becoming more regular, will maintain considerable of its voltage, the pain will lessen, and the patient will thus have an opportunity to recover. Patients must be encouraged to sleep. Keeping the body fairly warm is important and this may be accomplished by means of wrapping the patient in blankets and if necessary, placing hot water bottles beneath them.

Food may well be avoided for a day or two but small quantities of cool or warm water may be sipped. After a day or two fruit juice may be cautiously administered to be followed later by a milk diet. Vegetable broth and junket can also be given. The bowels should be kept open by enemas and a bed pan must be used as the patient is not to be allowed to get out of bed, but should remain therein for several weeks as a rule in order to give the infarct an opportunity to heal. When able to leave the bed the patient may sit in a chair but may only begin to move about a very little after a considerable period of time has elapsed. It may take a few months to recover from this serious condition and for a long time the patient is not to be allowed to do anything which is an exertion.

After the patient begins to convalesce the diet may be somewhat more liberal, consisting of fruits and fruit juices, broths, sweet milk, buttermilk, egg yolk, custards,

junket, jello and some whole grain products. Fresh air and sun baths are of value. At first only warm sponge baths are indicated but later on tepid or warm tub baths may be taken followed by cool sponging and some body massage. Constipation is to be corrected by enemas, mineral oil and laxative foods, such as vegetables containing bulk and cellulose.

Chronic Myocarditis. Chronic myocarditis is a slowly developing inflammatory condition of the heart muscle. This disease is one of the heart lesions which does not as a rule, develop or at least is not often recognized, until middle life, a large percentage of these cases occurring between fifty and sixty years of age, and at least seventy-five percent of all cases are found in persons between forty-one and seventy years of age. It is somewhat more common in men than in women, the ratio being as three to two. It may exist for a considerable period of time without being recognized or without causing any marked symptoms, or the symptoms may be referred to some other condition, such as digestive disturbances.

Symptoms of Chronic Myocarditis. The tendency to become easily fatigued is a frequent early symptom of this condition. Edema or swelling of the ankles or legs is a symptom which develops after the disease has persisted for a considerable period of time. It is at first very slight, coming on during evening as a puffing of the legs above the shoe tops. It usually disappears after one has been lying down for a considerable period of time so that after being in bed all night it is not observed in the morning. This simply means that owing to the position

in which a person lies in bed the edema is shifted to another portion of the body as it usually appears in the most dependent portion due to gravity. Sometimes there is an edema of the face, especially about the eyes and possibly nowhere else. When the edema is very marked the water-logged skin may crack and release considerable quantities of watery fluid. This entails considerable danger of infection on account of the usually poor nutrition of the tissues, making healing difficult and infection very easy. Symptoms of advanced failure of the heart's action are referred chiefly to the respiratory and digestive systems and to accumulations of fluid in the tissues beneath the skin and in the cavities of the body. Difficulty in breathing is usually a marked feature when the disease has progressed to a considerable extent. It follows exertion and in severe cases may be present even when the person is at rest. Some patients have attacks at night which resemble asthma. In many cases one cannot breathe well while lying flat and will have to maintain a semi-recumbent or even an erect position in sleep. There is more or less cyanosis or blueness of the lips and often of the finger nails. There is frequently a cough produced by congestion of the lungs and this cough is likely to become very troublesome. It may be a dry cough or there may be some frothy expectoration which, in some cases, is tinged with blood. There is generally more or less passive congestion of the lungs, and moist rales (bubbling sounds) are heard at the base of the lungs.

In the majority of cases the appetite is poor or may even be lost and there is gaseous distention of the stomach and bowels and usually more or less constipation. In

severe cases when there is a certain amount of cardiac failure there may not only be nausea but even vomiting and there is very apt to be pain and soreness in the stomach and in the right side of the abdomen. If congestion of the liver develops, as sometimes happens, jaundice may occur but this is usually rather slight in extent. The skin is often clammy and covered with cold sweat. The function of the kidneys is frequently quite seriously impaired. The urine may be very scanty and is apt to be concentrated and of high specific gravity. There is often considerable albumin and numbers of all types of casts, except waxy casts, present in the urine. The nervous system is sometimes affected and weakness, exhaustion and drowsiness may be quite marked. Insomnia is common. In many cases the memory is impaired and mental effort may cause considerable fatigue. One is apt to be very depressed at times and at other times very exalted.

Palpitation, flutterings, premature heart beats, known as extra systoles, may occur and there is usually more or less enlargement of the heart itself. In the early stages of enlargement of the heart the increased size may be due to hypertrophy or thickening of the heart muscle, while in the later stages dilatation or increase in the size of the cavities of the heart may predominate.

In chronic myocarditis the rate of the heart beat is generally more rapid than normal, even during rest. The rhythm is often disturbed and fluttering is present in a large percentage of cases. This may be transitory but in most cases it is more or less permanent. Often the rate of the heart beat is as high as 120 per minute and there is considerable irregularity both in force and in rhythm.

The rate of the heart beat varies from time to time and is markedly accentuated after exertion. Some of the beats are too weak to transmit a wave to the wrist so that there will be a loss of pulse beats. This is known as the pulse deficit, the number of beats of the pulse being less than the number of beats of the heart.

Heart block is often present, this condition being one in which the atrium or auricle of the heart does not contract in rhythm with the systole or contraction of the ventricle and this disturbs the ratio of contraction between the atrium and the ventricle.

Pain in chronic myocarditis occurs paroxysmally and is induced by emotional stress, excitement, physical exertion, especially after eating. It may result also from walking against a strong wind, or from drinking ice-cold drinks or from going out into the cold from a warm room, or from suffering from extreme nervousness or from any factor which calls upon the heart for increased work. The pain is located behind the upper portion of the breast bone or in the left chest and may radiate over the whole front of the chest, sometimes to the left shoulder, arm and hand, or to the left angle of the jaw. It occasionally extends to the right side and to the right arm. The pain varies in severity from mild discomfort to severe suffering and the patient feels as if the heart were being squeezed in a vise. This is often accompanied by a fear of death such as is so common in cases of angina pectoris. There is generally more or less pallor of the face and frequently cold sweats occur, although in some cases there is congestion and redness of the face instead of pallor during the attacks of pain. These attacks pass

off very promptly when one ceases all effort and with the cessation of the pain large amounts of gas are expelled from the stomach and colon. After the pain leaves the left arm a certain amount of numbness is apt to be felt in that limb for a time.

Treatment of Myocarditis. As soon as the condition has been recognized a thorough search should be made to discover if possible the presence of any focal infection. In people of middle age it is likely to be found in the teeth. It may of course, occur in other portions of the body, such as the tonsils, the appendix, the ovaries and the prostate gland, as well as in sinuses of the head. If any focal infection is discovered it must immediately be attended to and attempts made to eradicate it whenever possible.

As focal infection, as well as improper habits of living, probably over a period of many years, will be productive of a general systemic toxemia, steps must be taken to purify the bloodstream and to eliminate all poisons from the system. One has to protect the heart from over-taxation. This is necessary because the reserve power of the heart, which is normally quite large, is being constantly called upon to meet the demands of the body even while it is at rest. So that when the heart is diseased the reserve is less than normal and this makes it harder to meet the needs of the body. If the reserve power be small signs of heart failure are apt to follow even slight exertion and when there is no reserve left heart failure is present even during rest and relaxation, and even though a heart may be over-taxed and seemingly may recover it probably will never recover as fully

as before the strain has been put upon it. It is especially necessary to adopt measures to prevent over-strain of the heart muscle.

Severe physical or mental exertion, worry, anxiety and hurry are to be avoided. Overeating and other dietetic indiscretions are also to be carefully avoided and one must get a sufficient amount of sleep and rest. The general nutrition must be improved by regulation of the diet and the eliminations. If there are signs of advanced heart failure complete physical and mental rest is called for and this means confinement to bed, often for a considerable period of time.

If there is much edema, or dropsy, one should not take more than about three pints of fluid daily. This includes all forms of fluid such as water, soups, broth, fruit juices, etc. As a rule, a salt-free diet is called for. Occasionally a milk diet in restricted quantities is of great value in cases where edema is present.

Where advanced heart failure is not present graduated exercise is to be recommended in many cases. Violent exercise is of course to be avoided but the various movements designed to develop the chest may often be practiced to very good advantage. If one finds that exercise is taxing the heart in any way or causing any discomfort it is to be at once abandoned, at least temporarily, but one must not get the idea that all exercise is dangerous in cases of chronic inflammation of the heart muscle. If one does not take any exercise at all it will have a weakening effect upon the heart. The heart is a muscle and needs exercise the same as the muscles of other portions of the body, in order to keep it in good condition.

Gentle exercise, however, is one thing, while strenuous or over-taxing exercises are another. The former is beneficial; the latter detrimental. In most cases of chronic heart disease one of the most beneficial methods of exercising is walking. This must be begun by the taking of short walks at a slow pace on level ground and as one begins to improve the walks can be increased in length and the pace can be quickened. Still later as improvement continues, one may begin to walk up slight grades and increase the grades by degrees as one becomes more accustomed to this form of exercise. After a time it will be found that fairly steep grades can be taken without distress. A good plan is to use each grade for one week before increasing it. When starting on a new grade one should walk at a very slow speed and should take frequent rests.

In many cases of chronic myocarditis the treatment can very well be begun with a fast, continued for from three to ten days, according to the general condition of the patient. During a complete fast nothing but water is to be taken and not too much of that. A daily enema is also taken. After the fast a partial fasting diet for three to five days is often advantageous. Such a diet can well consist of one slice of whole wheat toast or zwieback taken twice a day and thoroughly masticated, drinking a certain amount of water. Sometimes a glass of buttermilk or other sour milk two to three times a day would be perfectly satisfactory. After a period of from three to five days a limited diet can be adopted to advantage and kept up for about a week. This diet should consist of foods containing from five to fifteen per cent carbohy-

drate content. Only a moderate amount of these foods should be taken. A partial list of such foods is as follows:

Apples	Cherries	Pears
Apricots	Corn	Peas
Artichokes	Currants	Plums
Bananas	Figs	Potatoes
Beans	Grapes	Prunes
Blueberries	Nectarines	Raspberries
	Parsnips	

One may also take additional foods such as are mentioned in the treatment for angina pectoris. In some cases the use of a milk and fruit diet alone is often of considerable value and gives better results than the more liberal diet mentioned above. When this milk and fruit diet is taken, three meals a day of sweet fruit and some form of sour milk is used. One usually takes about four glasses of milk and from one-quarter to half a pound of fruit daily. Instead of the sour milk and fruit one may take a salad diet if desired. These are very tasty and palatable and very satisfactory. Sample salad diets are as follows:

Two Meal Diet

In the morning: Fruit salad composed of juicy and sweet fruits with or without milk, either sweet or sour.

Evening: A large green salad with raw root vegetables such as grated carrots with or without sweet or sour milk.

Another good salad diet is as follows:

Three Meal Diet

Morning: Fruit as desired, with or without milk.

Noon: A green salad with two ounces of nutmeats or eight ounces of sour milk.

Evening: A green salad with sweet fruit and sour milk if desired.

The importance of limiting the amount of food taken cannot be over-emphasized as recovery or improvement often depends upon limiting the amount of food to the smallest amount which will satisfactorily maintain life. As one improves more food may be taken but never more than is necessary to improve the general nutrition.

Hydrotherapeutic Measures. The use of hydrotherapy is of a great deal of value in cases of chronic myocarditis. Of course, it is generally understood that a person suffering from heart trouble must not subject himself to shock, such as would occur from jumping into a cold bath or into the cold water of the ocean or lake or swimming pool. Neither should he expose his nude body to a cold shower at first. Yet he can, by degrees, become accustomed to cold water and this will often be a help as a tonic which will stimulate the circulation of the blood. The effect of cold water is to tone up the tissues, speed up the circulation, driving the blood in the veins toward the heart and thus actually relieving it of some of its work of pumping the blood through the capillaries.

A good way in which to accustom a sufferer from chronic myocarditis to the use of cold water is, for example, to apply cold water to one arm for a few seconds; the arm is then dried with a rubbing motion; then the other arm is similarly treated; then one leg, then the other and finally the chest, the abdomen and the feet. A

person with heart trouble should, as a rule, avoid taking very hot baths. Even when taking a fairly hot bath it is well to tie a towel, wet with cold water, about the temples. A warm or a hot bath may be followed by a cool sponge and a gentle rub, unless the reaction is poor.

Valvular Disease of the Heart. Valvular disease is one of the commonest heart disorders. It is not, however, limited to those persons of advanced years. It may occur at any age and may be either acute or chronic. In valvular disease there is usually also an inflammation of the membrane lining the cavities of the heart. This membrane is known as the endocardium and inflammation of the same is technically known as endocarditis. There are several forms of valvular disease. They are non-bacterial or simple and bacterial or myotic. The non-bacterial form may or may not be associated with rheumatism. There is a type of bacterial disease which is known as malignant endocarditis. This type is very acute and very serious. When the membranes lining the cavities of the heart become chronically affected the condition frequently spreads to the valves of the heart, causing what is known as valvular disease. There are several types of valvular disease which will be described later.

Acute Endocarditis. Acute endocarditis frequently occurs in young persons as a condition secondary to some other affection, such as articular or inflammatory rheumatism, St. Vitus' dance, pleurisy, pneumonia, Bright's disease and the infectious diseases such as scarlet fever, influenza, and diphtheria. It is also occasionally caused by the existence of a gonorrhreal infection. In its sub-

acute form the disease may occur from diseased tonsils, abscessed teeth and other focal infections.

The chronic form of the disease known as endocarditis is very apt to occur in those past forty years of age and is generally the result of certain changes of the nature of fatty degeneration or calcium deposits. Chronic endocarditis occurs in younger persons following acute attacks of the disease but in older persons it develops as the result of the structural changes mentioned above.

In chronic endocarditis the valves of the heart become affected in the majority of cases. In some cases however only one valve will be markedly affected, while in other cases two or more valves will be subjected to changes. These changes consist in either inefficient closure of the orifices or openings in the floor of the left or right atrium, producing a condition known as regurgitation or insufficiency, or in a narrowing of the opening (stenosis), resulting in interruption of the blood current in its passage from one chamber of the heart to the other or from the ventricles of the heart to the blood vessels opening into these ventricles.

These conditions, which interfere with the normal circulation of the blood and which are caused by valvular defects, the result of chronic inflammation, have a serious effect upon the body in general. One effect of interference with the circulation is that the heart has to work harder to normalize the circulation as much as possible. This finally causes it to increase in size and become what is known as hypertrophied.

When the heart enlarges for the purpose of normalizing circulation and this purpose is accomplished it is

known as compensatory hypertrophy, that is, the enlargement enables the heart to pump the blood through the arteries better and therefore compensates for the interference due to the changes in the valves. The duration of this compensatory period varies in different individuals, depending in part upon how that person takes care of himself and keeps from putting too much strain upon the heart or allowing focal infections to remain to further affect the endocardium or lining membrane of the heart. If the condition of hypertrophy exists and nothing is done to prevent its further development or if one continues to over-work the heart a time will come when this organ can get no larger and when this is the case increased or excessive heart action will so strain that organ as to cause its cavities to begin to enlarge and dilate. This puts the heart muscle on the stretch and tends to thin its walls. The natural result is that the voltage or reserve power of the heart is seriously interfered with and the heart contractions lose their force. This is known as loss of compensation, or decompensation. When this happens the circulation of the blood is impeded and many symptoms arise which are more or less serious and which will be described later.

Chronic valvular disease of the heart is a common condition and is found to exist in all countries. It is estimated that from half to one per cent of the population in civilized countries are affected by chronic endocarditis. In those countries where rheumatism is prevalent the percentage may be higher, while in those countries where rheumatic affections are not common this figure may be somewhat too high. The percentage would, however, be

about correct in such locations as the northeastern part of the United States and the northern part of Europe.

Types of Valvular Disease. There are five types of chronic endocarditis, namely, the congenital type or that in which the condition is present at birth; the rheumatic type, the syphilitic type, the sub-acute and chronic infectious type, and the arterio-sclerotic or what is known as the calcareous type. It is this latter type with which we are especially concerned. This type usually occurs in middle-aged and old persons and as stated above, may be due to fatty degeneration or to lime deposits in certain portions of the valves of the heart.

Varieties of Valvular Disease. There are eight different varieties of valvular disease of the heart. We have previously mentioned insufficiency or regurgitation and stenosis. Either of these conditions may attack any of the four valves of the heart so that we may have:

- (1) Mitral regurgitation; (2) aortic regurgitation; (3) tri-cuspid regurgitation; (4) pulmonary regurgitation; (5) mitral stenosis or obstruction; (6) tri-cuspid stenosis; (7) aortic stenosis; (8) pulmonary stenosis.

The symptoms differ according to the particular valve involved and the type of disease.

Mitral Regurgitation. If the cardiac muscle responds well no symptoms may be noted, but enlargement of the heart develops in time in order to compensate for the decreased amount of blood sent forward into the aorta. In mitral regurgitation inability of the mitral valve to properly close allows blood to be forced back from the ventricle into the atrium or auricle, thus reducing the amount which can be forced into the aorta. This causes a

rapid and strong pulse and marked shortness of breath on exertion. If a time arrives when compensation is lost there will be quite a severe pain in the chest after exercise, as well as a cough, difficulty in breathing, feeble and irregular pulse and blueness of the lips and finger tips. If compensation is permanently lost the result will be serious.

Aortic Regurgitation. In this condition the valves or parts of them adhere to the walls of the aorta at its point of entrance into the heart, or one or more of the segments of a valve may become lacerated or shrunken up so that it cannot completely close. This allows blood which should flow from the ventricle of the heart into the aorta to regurgitate or flow back into the ventricle and the additional effort of this ventricle to empty itself causes a thickening of its walls which is often very great. If compensation is sufficient the symptoms are mild or sometimes almost entirely absent but as the muscular walls of the heart increase in thickness, certain symptoms develop. There is very forcible heart action, headache, insomnia, ringing in the ears and throbbing of the arteries in the head or extremities. When failure of the heart muscle occurs there develops difficult breathing, cough, blueness of the lips and finger nails, frequently enlargement of the liver, congestion of the kidneys, dropsy which may affect the lower extremities and may also affect the abdominal cavity.

Tri-cuspid Regurgitation. When this is present some of the blood which passes from the right atrium into the right ventricle is allowed to flow back into the right atrium instead of being forced into the right ventri-

cle. The symptoms of this condition are those of stagnation of the venous system and include dilation of the veins in the neck with a marked pulsation, difficult breathing, congestion of the liver and kidneys and dropsy.

Pulmonary Regurgitation. In pulmonary regurgitation some of the blood which is pumped from the right ventricle into the pulmonary artery is allowed, on account of the non-closure of the aortic semi-lunar valve, to flow back into the right ventricle. This produces such symptoms as cough, blueness, distension of the superficial blood vessels of the body, palpitation of the heart, pain in the chest and often attacks of suffocation.

Mitral Stenosis. Mitral stenosis is an obliteration of the mitral valve which prevents the full amount of blood which should pass from the left atrium into the left ventricle from reaching the ventricle. This, as a rule, produces only slight symptoms, unless compensation fails, in which case there develop congestion of the lungs, blueness of the lips and finger tips and symptoms of heart failure. The blood pressure frequently becomes low and the pulse very feeble.

Aortic Stenosis. In aortic stenosis all of the blood which the left ventricle is supposed to pump into the aorta through the aortic valve does not leave the ventricle owing to the contraction or narrowing of the leaves of the mitral valve. They project inward and become rigid and thickened, often containing deposits of fatty tissue or lime and they cannot be pressed backward as they should by the blood during the contraction of the ventricle which forces the blood forward into the aorta. This form of valvular disease is nearly always one of

advanced life and is generally associated with arteriosclerosis.

The symptoms of this type of valvular disease are slight as long as compensation remains. The pulse is generally rather slow and hard. In many cases, owing to the prevention of the passage of the full amount of blood from the left ventricle into the aorta, the blood-vessels of the brain contain less blood than they should and certain symptoms of cerebral anemia may result. These are: Pallor of the face, attacks of dizziness, fainting spells and sometimes slight convulsive movements. If compensation is lost and dilatation of the left ventricle occurs there will be difficulty of breathing, feeble pulse, and congestion of the lungs.

Tri-cuspid Stenosis. In this condition owing to the fact that blood cannot pass as it should from the right atrium to the right ventricle, there will be marked symptoms such as extreme blueness of the lips, finger nails and sometimes of the cheeks, difficulty of breathing, pulsation over the large veins of the neck (the jugular veins), enlargement of the liver, and certain thrills or shocks felt over the right side of the heart.

Pulmonary Stenosis. This is generally a congenital condition, that is, it is present at birth. Persons suffering from pulmonary stenosis are weak, they develop slowly, they have soft and flabby tissues, the bones are soft and they are very poorly nourished.

It must be remembered that often more than one valve of the heart will be affected in the same individual. There are various combinations which are found and these of course have a considerable effect upon the

general symptoms. It is, however, not necessary in a book of this character to go into detail as to these various combinations.

Heart Murmurs. As to the murmurs which are heard by the examining ear of the doctor in the various types of valvular heart disease it may be said that they vary according to the particular valve which is affected, the extent of the trouble, and the type of the valvular disease.

These murmurs are known as pre-systolic, systolic and diastolic. Pre-systolic murmurs are heard just before the heart beat; systolic murmurs occur with the heart beat and diastolic murmurs occur after the heart beat. There are normally two sounds when the heart is beating. The first sound, caused when the heart contracts to force the blood into the arteries, is known as the systole and is produced by the impact of the apex of the heart against the chest wall. The second sound is caused by the sudden closure of the aortic and pulmonary semi-lunar valves, described at the beginning of this chapter.

The first sound is slightly longer and softer than the second sound. The second sound is a sharp, abrupt click. The two sounds correspond to the syllables "lub-dup"—"lub-dup." They follow each other quickly, after which there is a short interval of silence called the diastole. The various forms of valvular disease produce different kinds of murmurs and it is by reason of these differences that a diagnosis of these types of valvular diseases may be the more readily made on listening to the heart with the stethoscope.

Treatment of Valvular Disease. In treating the

various forms of valvular disease of the heart, the principal thing is to try to improve the general condition of the heart muscle. Structural changes in the valves themselves greatly influence any benefit which may be received from treatment. What is called for particularly is to get rid of any focal infection and to eliminate any existing toxemia as well as to take steps to build up the heart muscle, and the body in general. This usually can be done, unless the patient has suffered such severe degeneration of the heart muscle that there is great danger of heart failure at any moment. It is, however, remarkable what can be done with these damaged hearts by natural methods. Get rid of existing toxemias, build up the system, strengthen the heart muscle and the sufferer from valvular disease will take on a new lease of life.

Persons affected with valvular disease of the heart can and do live as long as anyone else, provided they have proper care and attention. There is of course a strong mental condition which has often to be overcome. Persons with heart trouble who know they have heart trouble and who know that such a condition often terminates fatally without warning are apt to feel that they may drop off suddenly at any time. When this idea is always in the back of one's head it naturally has an extremely bad effect. These people should know that valvular heart trouble can be helped and that they are the ones to help themselves. An optimistic outlook is worth a lot of cases of this kind and goes a long way toward prolonging life.

There are certain important matters which have to be

taken into consideration when treatment is begun and these, are according to the heart specialist, Dr. Da Costa:

- (1) The state of the heart muscle.
- (2) The rhythm of the heart action.
- (3) The condition of the blood-vessels throughout the body.
- (4) The length of time the condition has existed.
- (5) The general health of the person affected.
- (6) The secondary results of the heart lesion.

Diet in Valvular Disease. In the treatment of chronic valvular disease of the heart the most important lesson to learn is that of diet. The amount of food taken must be only that amount which the body requires for its maintenance, anything more being superfluous and harmful. The food given must be of a kind which is easily digested and easily assimilated. A limited diet of a very abstemious nature is called for. An excellent plan is to weigh the patient each day and regulate the amount of food to the daily body weight. If the weight falls below the minimum which should be maintained in order to keep the patient in a vigorous condition, the diet may be increased by the addition of weight-gaining foods but only a sufficient amount of such foods to bring the weight up to the required point. If the weight increases above the minimum point the diet is to be cut down by decreasing the amount taken at each meal, paying special attention to starches, sugars and fats. In this way, over-eating can be avoided.

When the treatment of a person suffering from valvular disease of the heart is to be begun, it is often of

value to inaugurate the treatment with a fast. This may be continued for from three to ten days, during which time no food is taken, although as much water as may be wanted should be drunk. The length of the fast will naturally depend upon the general condition and vitality of the patient. There are some cases in which the patients are extremely weak and unable to do much and here it may be inadvisable for them to attempt a long fast, but they may take repeated short fasts of two or three days to advantage, or if preferred, a diet of fruit juices, especially orange juice, may be taken instead of a complete fast. When this is done the juice of from six to eight oranges daily will be sufficient. During the fasting period a daily enema is to be given, the temperature of the water being just below the body temperature, which is normally 98.6 degrees F.

The fast is broken by a fast-breaking regimen, the duration of which depends upon the duration of the fast. This regimen is continued as a rule, from two to three days or longer if needed, and may consist of orange juice, vegetable broth or juicy fruits, such as oranges, grapefruit, apples and peaches. In some cases the fast may be broken by the taking of fruits, as mentioned above, together with a glass of sweet milk three times a day. In some individuals the fast may be followed immediately by an exclusive milk diet for a few days, taking a glass of milk every hour for ten hours daily.

After a few days it is well, in most cases, to place the patient upon a limited diet of fruits, fresh green vegetables raw or cooked, vegetable and fruit salads and some milk. This diet can be adhered to for a considerable

period of time. Overeating is to be strictly avoided. It is important to give only enough food to maintain the minimum normal body weight and to keep the system sufficiently nourished. Unless the food is properly selected and properly prepared and unless correct food combinations are used, a certain amount of gas is liable to be generated in the stomach and intestine. This is apt to cause pressure upon the diaphragm and interfere with the heart action, causing considerable distress, shortness of breath and often a good deal of pain in the chest. It is important that for a time after eating, the patient remain more or less quiet as exertion after partaking of food is frequently the cause of attacks of dyspnea, or difficulty in breathing, rapid heart action and heart pain.

Other Important Measures. Patients suffering from this form of heart trouble as well as some other diseases do well if they can live in a warm, dry climate where the changes in the temperature are not marked. They must also be very careful about sudden changes in temperature, such as will occur when going from a warm room into the outer air when the weather is cold. It is most advisable under these conditions to stand on the front steps of the house for a few moments, breathing slowly and deeply through the nostrils and gradually becoming adjusted to the change before exerting one's self in walking. Running is also to be avoided.

Sudden exertions of this character over-stimulate the heart, bring on attacks of rapid and forcible heart action and shortness of breath and if the heart is seriously affected, they often cause sudden attacks of acute dilatation with congestion of the lungs and possibly the occur-

rence of pulmonary edema, or the filling up of the small bronchial tubes with fluid. Walking against the wind is also to be avoided.

Sufferers from valvular disease of the heart should retire early at night and should assume the most comfortable position in bed. There are many persons who are unable to lie flat in bed without finding it very difficult to breathe. In such cases the head and shoulders should be raised on pillows. Many of these cases, owing to interference with the circulation, are affected with swelling of the feet and legs. The swelling disappears sometimes entirely after the patients have been in bed for a time but will return when they are up and around and by evening it may be quite marked. In severe cases of some forms of valvular disease there is a general dropsical condition of the skin of the entire body and in still other cases there may be accumulations of fluid in the cavities in the interior of the body, constituting what is known as ascites. In some cases fluid will form in the pleural cavity or within the pericardium, the latter being the membranous sac within which the heart lies. In such a case the heart action is greatly interfered with and frequently becomes extremely rapid and irregular and the breathing often seriously disturbed. Measures used for the relief of dropsical conditions such as have been mentioned, will be discussed later.

Exercise. In the treatment of chronic valvular disease of the heart, in the absence of dropsy or cardiac dilatation, exercise is most important. This builds up and strengthens the muscles through the body, including the heart, for the heart is a muscle and is also in need

of exercise if it is to be kept in good condition, and if it is not in good condition exercise will help to strengthen it. The mere beating of the heart is not considered as real exercise for that organ in the true sense of the word. Naturally in valvular disease violent or prolonged exercise is not called for but mild calisthenics are often to be recommended. In addition, massage and manual treatments, given by an attendant, are also of great value. At any time that exercising seems to be taxing the heart or causing shortness of breath or other discomfort, it is to be stopped at once, at least for a time, but in most cases exercise is of the greatest value and can be taken without danger. Without some exercise the heart muscle is apt to become soft, flabby and weaker. In beginning to take exercise for heart trouble, one at first takes only the simplest and easiest movements, gradually increasing both the vigor of the exercises and the length of time they are to be indulged in.

Walking is one of the best exercises that can be recommended in these cases. One may begin with short walks on level ground, taken at a very moderate pace. As one begins to feel improvement, one may gradually increase both the distance and the pace of the walk. Later on slight grades can be taken which may gradually be made steeper and steeper as one finds that one can climb without exertion. Always remember, however, that over-exercise is harmful and is to be avoided. It is often a very bad thing to continue exercising just because one has started. If any discomfort is felt the exercise should be stopped at once.

Bathing in Valvular Disease. As to the matter of

bathing, sufferers from valvular disease of the heart may take frequent warm baths. They are, however, generally to be followed by cool sprays and by massage and friction rubs. Persons suffering from heart troubles must avoid going into cold water such as when going in swimming. The sudden shock on coming in contact with cold water is not good and may frequently do harm, but if one can become gradually accustomed to cold water, it is an excellent thing. This can be accomplished as a rule, by taking cool showers after a warm bath, and by degrees making the water of the showers colder and colder. After a time these sufferers will find that they can take showers of comparatively cold water without shock or harm. Cold water has a most excellent tonic effect upon the entire body. Another very good way to accustom one's self to is, as described in earlier pages, to expose one extremity to fairly cool water for a few moments, dry it off and then expose another extremity and go through the same procedure until the entire body has been subjected to this treatment. In this way one can get a fairly cold bath without shock.

Cerebral Thrombosis and Embolism. Cerebral thrombosis and cerebral embolism are conditions in which there is an occlusion or a shutting off of a blood-vessel in the brain from the formation of a thrombosus or the presence of an embolus. An artery may be obstructed either by an embolus or a thrombosus while veins are only obliterated by thrombi as the blood in them flows to, and not away from, the heart. In cerebral thrombosis or embolism the blood clot in cutting off the circulation to some localized part of the brain tissue,

produces an anemia or bloodless condition of that part and it receives no further nourishment.

Symptoms of Cerebral Thrombosis and Embolism. Cerebral thrombosis is generally characterized by a gradual onset. It is as a rule, the result of chronic inflammation of a blood-vessel or of arteriosclerosis or hardening of the arteries. The condition is most common in the aged. Sufferers develop headache and dizziness varying in intensity and frequency, irritability, moroseness, despondency, absent-mindedness, disorders of vision, impaired memory, hesitating and mumbling speech, muscular weakness and trembling, interference with normal locomotion, and later on paralysis. The paralysis may be one-sided (hemiplegia) and may appear gradually or there may be a sudden loss of consciousness as in apoplexy, followed by the paralysis. Many of the patients who suffer from this form of softening of the brain become demented and finally pass away from general exhaustion.

In cerebral embolism the symptoms always occur suddenly and may be very grave, although in some cases they are quite mild. Cerebral embolism is not a condition developing in old age only but frequently occurs in earlier life. However, it does occur quite often in those who are past middle age. The symptoms are the sudden occurrence of severe vertigo or dizziness, confused state of the mind, twitching of the muscles, usually of one side of the body, vomiting and paralysis. The mental faculties usually remain unimpaired but there is a certain hesitancy in speech. The condition in mild cases clears up after a few months and the patient again becomes

normal. In the severe cases, however, in addition to the symptoms noted above, there are headaches, flushings of the face in some cases, while in others the face is pale. There is also sudden unconsciousness. The power of articulate speech is lost. In some cases the mind remains clear, but in others the mental faculties become much impaired. Sometimes the loss of speech is recovered but often the ability to talk is permanently lost. In the severe cases death may occur very promptly, just as it does in severe attacks of cerebral hemorrhage or apoplexy. In other cases the patient lives but may be permanently paralyzed or impairment of the mental faculties may remain.

Treatment. The treatment of these conditions by natural means is very similar to that instituted in cases of apoplexy. There is this difference, that in cases of cerebral thrombosis and embolism the object is to re-establish the circulation in that part of the brain tissue which has been deprived of its blood in order to prevent deterioration or softening of the brain substance at this point. A fast of from three to ten days is instituted, depending upon the weight and the general vitality of the patient. The fast is followed by a regular fast-breaking regimen, such as has been suggested in apoplexy. The milk diet following the fast is of the greatest value, or if an exclusive milk diet cannot be taken, a milk and fruit diet previously mentioned may be resorted to. Vitality-building regimens which tend to build up the system and increase its vigor are in most cases, to be undertaken. If, however, the condition is very severe and there are marked symptoms rest in bed is imperative.

In such cases the fast should be very valuable. When a person is in bed and suffering from either of these conditions the head should be elevated on a bed-rest or on pillows.

CHAPTER FOUR

Human Arteries After 40

ARTERIOSCLEROSIS or hardening of the arteries is a disease which is more prone to develop during or after middle life than almost any other chronic ailment. While it may and often does occur in younger persons it is in the middle-aged and in old persons that it is most commonly found.

Arteriosclerosis is one of the oldest diseases of record. Syphilis is in all probability the oldest disease of which we have any record but arteriosclerosis has been known for many centuries. The presence of this disease in the bodies of some of the ancient Egyptians has been recently demonstrated. Claudius Galenus or Galen as he is known to posterity, a celebrated Greek physician who lived in the second century, wrote several books on the pulse and described certain conditions of the arteries which he had discovered in the practice of his profession. He recognized the fact that the arteries had three separate and distinct coats and that there was a marked difference in the pulse of various persons, the pulse of some being hard and that of others being soft. He apparently had not discovered why this was and it was not until the eighteenth century that it was discovered that the blood vessels, and especially the aorta or the main trunk artery in the body, were subject to degenerative changes

producing hardening of their walls. The name arteriosclerosis was given in the year 1833 to this condition of hardening of the arteries by a distinguished physician named Lobstein.

Structure and Function of the Arteries. As arteriosclerosis is a disease affecting the arteries of the body some knowledge of the structure and the functions of these important vessels is of value as one can thus understand more clearly the changes that take place in them when they are pathologically affected, in other words, when they are diseased.

The arteries are the blood-vessels which carry oxygenated blood from the heart to the tissues; the veins bring deoxygenated blood back from the tissues to the heart whence it is sent to the lungs to be reoxygenated. It then returns to the heart to be again pumped into the arteries to go to the tissues as before. The arteries which carry blood to the tissues are called systemic arteries. The oxygenated blood is pumped from the left ventricle of the heart (described in the chapter on heart diseases) into the aorta, the main artery of the body situated in the trunk. The aorta gives off branches which divide and subdivide many times becoming smaller and smaller and which, when finally reaching the tissues, are extremely minute in size and are called capillaries.

The oxygen and the nutrient material reaches the tissues in this manner in the arterial blood and serves to nourish them and to aid in the process of combustion or metabolism.

Arteries are circular or cylindrical in shape and are

of considerable thickness. They are composed of three main coats : the external, the middle, and the internal.

The external coat (*tunica externa*) is composed of connective tissue and longitudinal elastic fibres. This coat gives strength and toughness to the arteries and prevents undue dilatation.

The middle coat (*tunica media*) contains circular, smooth muscular fibres between which are distributed circular elastic fibres. This coat gives to the arteries their elastic and contractile character essential to proper functioning. The middle coat is thicker in the larger arteries than in the smaller ones and the proportion of the muscular and elastic tissue varies with the size of the artery. Thus in the aorta the amount of elastic tissue is considerable whereas in the smaller arteries the smooth muscle tissue predominates. It is due to the middle coat that the arteries maintain their shape and do not collapse when cut or when empty.

The inner coat (*tunica intima*) consists of an inner smooth layer called *endothelium* and an outer layer of elastic tissue. This coat provides a smooth surface and serves to reduce friction for the circulating blood.

The smooth muscular coat of the arteries is supplied with a network of nerves called *vaso-motor* nerves. These are of two kinds, *vaso-constrictor* and *vaso-dilator*. The action of these nerves upon the muscle tissue of the arteries regulates the calibre of the arteries and therefore the arterial pressure as well as the distribution of blood to the various parts of the body. This keeps the arteries in a condition of tone maintaining normal arterial pressure. The *vaso-dilator* nerves cause dilatation

of the arteries and this is thought to be due to an inhibiting process whereby the smooth muscle tissue relaxes. The vaso-constrictor nerve fibres are in constant activity in order to maintain proper tone of the arteries.

As the arteries divide and subdivide they at length become very small indeed and are then known as arterioles. These arterioles divide into still smaller vessels having a diameter of from $1/1200$ to $1/3000$ of an inch, which are composed of but one coat of endothelial tissue and are called *capillaries*. The oxygen and the nutrient material in the blood passes to the tissue through the walls of these capillaries.

The Nature of Arteriosclerosis. In this disease certain changes occur which are structural in their nature and which produce a thickening of the walls of the arteries affected but instead of making them stronger they become, on the contrary more brittle and subject to rupture under strain. Hardening of the arteries may be more or less local in character or it may be general. There are three principal types of this disease, the *nodular*, the *diffuse*, and the *senile* type. In the former type the aorta and some of the largest of the systemic arteries are the ones principally affected. In the diffuse type the larger arteries of the body are generally not affected but the smaller arteries and especially those in the brain, the kidneys, the spleen and the heart are the ones attacked. The third type or what is known as the *senile* type is the one most usually developing in old age. In this type the arteries of the entire body are affected.

The type most apt to lead to sudden and serious results is probably the cerebral form of the diffuse type

because in this particular form of the disease the arteries of the brain are affected and are apt to become very brittle from calcareous deposits, making it easy for them to rupture as a result of excitement, strain or any condition which sends a sudden flow of blood up into the head. If an artery in the brain ruptures it is immediately followed by a hemorrhage into the brain tissues causing pressure in whatever portion of the brain the hemorrhage happens to take place. This condition constitutes what is commonly known as a "stroke," the technical name for it being *cerebral hemorrhage* or *apoplexy*.

Blood Pressure in Arteriosclerosis. In the majority of cases of hardening of the arteries the blood pressure will be found to be high, sometimes extremely high, varying largely of course with the amount of hardening present, the extent of the condition and the state of the heart muscles. There are however many cases of the disease in which there is no hypertension in the arteries and hyper- or increased tension is the cause of high blood pressure. In cases of this kind there will not only be no elevation of blood pressure but on the contrary it may be below normal. A low blood pressure in connection with hardening of the arteries is a bad combination because it is usually produced on account of lack of voltage or "punch" in the muscular fibres of the heart and as a consequence the heart cannot propel the blood forcibly enough through the arteries. When this combination of arterial hardening and low blood pressure exists the heart needs close watching.

Structural Changes in Arteriosclerosis. In hardening of the arteries certain characteristic changes take

place in them. In the first place there occurs a formation of connective tissue in the walls of the arteries with a thickening and hardening of those walls and a consequent diminution in their calibre. This naturally interferes to a greater or less extent with the free passage of blood through them which of course necessitates an increase in the force of the heart beat in order to pump the blood through the arteries with sufficient force to carry it along to the tissues of the body and to keep it in circulation at a normal rate and in normal quantity. Naturally this gives the heart a lot of extra work to do and as a consequence its own walls tend to thicken and the entire organ becomes more or less enlarged. This may be productive of no special harm if the condition does not get beyond the stage of simple enlargement, but should the hardening continue to develop and become more marked and the calibre of the arteries become smaller and smaller the call upon the heart for additional voltage becomes more imperative. The heart muscle becomes thicker and thicker, due to over-exertion in its effort to meet this demand. But a time arrives when this thickened and hypertrophied heart cannot thicken and enlarge any more and then this organ, still trying to stabilize the circulation begins to tire. The result is that the heart begins to dilate. This means that there is an increase in the size of one or more of the cavities of the heart and this dilatation tends to thin out and weaken the walls of the organ interfering with the force of its muscular contractions or beats and as a further result there is a serious interference with the proper circulation of the blood

in the arteries, because of the weakness of the heart beats. This induces a train of serious symptoms.

In the structural change mentioned above the internal surface or lining of the arteries becomes irregularly thickened with deposits which may be fibrous in character and dense and hard, or may be more or less gelatinous and translucent, or may take the form of calcareous or chalky deposits. It is the latter condition which renders the arterial walls brittle and in the diffuse form of the disease where the arteries of the brain are apt to be involved sudden and most critical conditions may arise in the form of cerebral hemorrhage already mentioned.

Results of Cerebral Hemorrhage. When a hemorrhage into the brain does occur much depends upon its size. If the hemorrhage is of considerable amount the suffusion of the brain tissue with blood will produce unconsciousness and usually death within a few minutes or a few hours. If the hemorrhage is less extensive it will as a rule produce unconsciousness which will last for a longer or shorter period of time and when consciousness returns it will be found that there is present some form of paralysis depending upon what part of the brain was affected by the hemorrhage.

If the hemorrhage is limited the resulting blood clot which forms may absorb fairly rapidly and the patient may recover and be perfectly or almost perfectly normal again. In the majority of cases however, the clot absorbs slowly and its pressure upon the brain tissue produces in this tissue more or less degenerative change. There may also be some change in brain tissue deprived of its supply of blood due to the rupture of the artery. All

this results as a rule in the production of paralysis. This paralysis may be of the facial muscles or of an arm or a leg or both arm and leg on one side of the body, or of the muscles of the throat, tongue, lips and larynx causing loss of articulate speech. It may in some cases affect the respiratory muscles between the ribs which are involved in the process of breathing. Paralysis of the muscles of respiration greatly embarrass breathing and may, if the muscles on both sides of the chest are affected, actually cause death from inability to breathe, a condition called *apnea*.

If the chalky deposits in the walls of the arteries are very great in quantity these arteries may be changed into hard, unyielding tubes.

In some cases there is a subsequent destruction of the thickened internal surface of an artery with the production of an ulcerated surface. This is a very serious complication, especially as the roughened edges of the ulcer as well as its surface may become covered with larger or smaller particles of clotted blood called *thrombi*. Should one or more of these thrombi break away from the ulcer and be carried into the general circulation it is very apt to find its way into a small blood vessel, too small for it to pass through and it will then act as a plug or embolus preventing the passage of blood through this plugged vessel to the tissues beyond the plug and as a consequence of their failure to receive proper nourishment these tissues will deteriorate and often die with serious results to the patient.

Causes of Hardening of the Arteries. Hardening of the arteries has for its primary and fundamental cause

some form of toxemia or intoxication. As one gets older the tendency of the arteries to harden becomes more marked, but if one has lived as one should have lived during the earlier years of life and has maintained a condition of normal health throughout these earlier years this tendency should be very slight. As stated in the opening chapter a man is as old as his arteries and his arteries will not become prematurely old if he has lived a normal life and has obeyed Nature's laws.

Hardening of the arteries is a disease which develops very slowly and insidiously and it is often hard to show "the exact relationship between the cause and the effect, that is, between toxemias, infections, old age and high blood pressure on the one hand and the structural changes in the arteries themselves on the other hand" (Cecil).

While the fundamental cause of arterial hardening is in the majority of cases a toxemia due to improper living habits there are also other conditions which have a pronounced influence upon the development of this condition. There are certain chronic intoxications such as lead poisoning, gout, rheumatism and typhoid fever as well as scarlet fever, diphtheria and influenza which predispose to arterial disease while diabetes and Bright's disease certainly have a close relationship to this condition and this seems to bear out the belief of many scientists that there is some fairly intimate relationship between disturbances of metabolism and arteriosclerosis.

The excessive and sometimes even the moderate use of tea, coffee, alcohol and tobacco are believed to be factors in the development of arterial changes. Overwork, worry and mental strain all have an undoubted influence, but

irregular and wrong habits of living extended over a period of many years may be classed as the fundamental cause of the disease, other factors being strongly contributing causes.

Lack of sufficient exercise, chronic constipation, and the eating of heavy, rich foods especially those containing an excess of animal protein together with a deficiency in those foods containing essential minerals and vitamins such as fruits, and fresh vegetables, all tend to create more or less systemic toxemia and constitute probably the most prolific causes of hardening of the arteries.

As it takes a considerable length of time to develop this condition to a marked degree one must not get the idea that when he finds himself the victim of arteriosclerosis it is because of recent derelictions for it usually is not. It is generally the result of years of indiscretion. That is one of the reasons why hardening of the arteries is classed as a disease of middle age. While one sets the stage for it in one's earlier life the symptoms usually do not appear until one has reached middle life.

As the arteries begin to harden they naturally lose their elasticity and become more or less tortuous in shape in many cases resembling a wriggling worm. This is often very noticeable upon the temples of old men and women. Bulging enlargements are also sometimes to be found on these arteries.

Symptoms of Arteriosclerosis. The symptoms of arteriosclerosis are sometimes indefinite and not well marked, especially in the early stages of the disease, therefore considerable progress is often made by the dis-

ease before the patient feels that there is something wrong with him.

The symptoms vary of course with the arteries affected, their distribution in the body and the extent of the structural changes which have taken place.

As stated before, the most constant symptom is hypertension. This hypertension prevents the proper expansion of the arteries when blood is pumped into them from the heart and is the cause of the high blood pressure. The degree of blood pressure depends naturally upon the amount of resistance offered by the hardened arteries and the force of the contractions or systoles of the heart muscle.

The development of the disease is so slow and insidious that in its earlier stages symptoms to which the attention of the patient would naturally be drawn may be entirely lacking or so slight as not to attract attention. Often the existence of arterial hardening will be discovered only when the patient consults a doctor for some other condition from which he is suffering and a general examination discloses the presence of arteriosclerosis.

The earliest symptom is often a feeling of general indisposition. There may be some absent-mindedness or more or less loss of memory especially for recent events, as well as some loss of physical strength. This is particularly true in cases which develop later in life. One is apt to lose his powers of concentration. It becomes gradually harder and harder to accomplish anything which requires mental effort. Nervous symptoms are apt to develop especially irritability, loss of temper, depres-

sion of spirits, loss of mental stability, and the occurrence of attacks of hysteria and insomnia.

The digestion is often affected, the appetite is lost, flatulence and distension of the abdomen with gas is common and constipation develops.

The occurrence of cramps in the muscles especially of the calves of the legs is very common and there is very often numbness of the fingers or toes and frequently of the soles of the feet.

There is, as a rule, considerable loss of weight but this is generally very gradual and often not particularly noticeable unless the patient makes a practice of weighing himself at regular intervals.

The skin becomes very dry and tends to become wrinkled and often scaly and in many cases rubbing the dry skin will cause the dropping off of fine white powdery dust.

In the so-called senile or old man's type of the disease the blood pressure is very apt to be irregular, high at times and at other times much lower or even almost normal, though there is generally some elevation. But it becomes high at times after excitement, overeating, exertion and from other special causes.

As the disease progresses the symptoms relating to the nervous system tend to become more and more marked. The memory and the power of concentration become poorer and poorer until the patient has difficulty in carrying on an ordinary conversation. There are times when he may even lose his identity, when he cannot pronounce the names of articles, or mis-calls them, or cannot remember their names at all. This constitutes what is known as

ease before the patient feels that there is something wrong with him.

The symptoms vary of course with the arteries affected, their distribution in the body and the extent of the structural changes which have taken place.

As stated before, the most constant symptom is hypertension. This hypertension prevents the proper expansion of the arteries when blood is pumped into them from the heart and is the cause of the high blood pressure. The degree of blood pressure depends naturally upon the amount of resistance offered by the hardened arteries and the force of the contractions or systoles of the heart muscle.

The development of the disease is so slow and insidious that in its earlier stages symptoms to which the attention of the patient would naturally be drawn may be entirely lacking or so slight as not to attract attention. Often the existence of arterial hardening will be discovered only when the patient consults a doctor for some other condition from which he is suffering and a general examination discloses the presence of arteriosclerosis.

The earliest symptom is often a feeling of general indisposition. There may be some absent-mindedness or more or less loss of memory especially for recent events, as well as some loss of physical strength. This is particularly true in cases which develop later in life. One is apt to lose his powers of concentration. It becomes gradually harder and harder to accomplish anything which requires mental effort. Nervous symptoms are apt to develop especially irritability, loss of temper, depres-

sion of spirits, loss of mental stability, and the occurrence of attacks of hysteria and insomnia.

The digestion is often affected, the appetite is lost, flatulence and distension of the abdomen with gas is common and constipation develops.

The occurrence of cramps in the muscles especially of the calves of the legs is very common and there is very often numbness of the fingers or toes and frequently of the soles of the feet.

There is, as a rule, considerable loss of weight but this is generally very gradual and often not particularly noticeable unless the patient makes a practice of weighing himself at regular intervals.

The skin becomes very dry and tends to become wrinkled and often scaly and in many cases rubbing the dry skin will cause the dropping off of fine white powdery dust.

In the so-called senile or old man's type of the disease the blood pressure is very apt to be irregular, high at times and at other times much lower or even almost normal, though there is generally some elevation. But it becomes high at times after excitement, overeating, exertion and from other special causes.

As the disease progresses the symptoms relating to the nervous system tend to become more and more marked. The memory and the power of concentration become poorer and poorer until the patient has difficulty in carrying on an ordinary conversation. There are times when he may even lose his identity, when he cannot pronounce the names of articles, or mis-calls them, or cannot remember their names at all. This constitutes what is known as

aphasia. These attacks are often temporary in their nature but tend to become more and more frequent until at last the condition becomes permanent. There are often attacks of temporary paralysis of the muscles of the face, the tongue, or the extremities even though there may not be any cerebral hemorrhage. In the most serious cases there is a gradual mental deterioration sometimes progressing to the point of dementia. Those persons who pass away as a result of hardening of the arteries are very apt to do so from attacks which may be referred to the heart, or to a gradual uremic poisoning from kidney involvement, or from a stroke of apoplexy. In the majority of cases death follows an attack of convulsions or while in a condition of coma.

Symptoms Referable to the Heart. In the majority of well marked cases of hardening of the arteries symptoms develop which show involvement of the heart muscle. These are due to lack of nourishment of the heart muscle and to the extra work demanded of the heart in attempting to keep the circulation of the blood normal. In addition to the chronic inflammation of the heart muscle which is induced, and the development of angina pectoris as the result of hardening of the coronary or heart arteries, certain valvular lesions are also apt to develop. These are due to structural changes in the valves.

The symptoms most noticeable when there are heart complications are difficulty in breathing or what is known as *dyspnea*, on moderate exertion at first, but later on less and less exertion is needed to produce shortness of breath. *Dyspnea* is apt to occur during sleep and the

patient suddenly wakes gasping for breath. These attacks sometimes come on in paroxysms and are often accompanied by severe pains in the region of the heart. There are several other symptoms which are referable to the heart which will be described in the chapter on chronic degenerative lesions of that organ. We may however state that most cases of the diffuse type of arterial hardening are accompanied by heart complications which develop a number of extremely uncomfortable symptoms such as pain in the heart or in the chest behind the breast bone, rapid and irregular heart action, dropping of beats, dyspnea, rapid pulse and swelling of the ankles and legs.

Symptoms Referable to the Kidneys. Kidney complications are particularly common in arteriosclerosis. Owing to the thickening of the arteries of the kidneys and the narrowing of their lumen or calibre the functions of these organs is interfered with quite seriously. The waste products which are normally excreted by the kidneys cannot be properly extracted from the bloodstream, but remain to further poison the system and induce a condition known as uremia. In such cases characteristic symptoms develop which are usually very marked. The urine becomes more or less scanty, the specific gravity is high and considerable albumin as well as hyaline casts will be found in the urine. Casts are small masses of matter which form in certain cavities and take the form of the cavity in which they are formed. In this case these casts are formed in the minute convoluted or twisted tubules in the interior of the kidney and are called hyaline casts because they are glassy or crystal-

line in appearance. When the kidneys are normal casts do not form.

This particular stage of kidney involvement does not usually occur until the arterial trouble has progressed to a considerable degree. In the early stages of arterial hardening the urine is apt to be normal in amount and also in specific gravity though there will often be a trace of albumin present and sometimes a few hyaline casts. It is usually failure of heart action which makes the kidney symptoms more marked.

Leg Pains and Cramps. One of the commonest symptoms of hardening of the arteries of the diffuse type is the occurrence of pains in the calves of the legs coming on during exercise. This is due to the fact that walking and other exercise of the leg muscles increases combustion and calls for more nutrient material, the same being supplied by the blood. If, however, the arteries supplying blood to these parts are thickened sufficient blood cannot be supplied rapidly enough to meet the demand and painful spasm of the leg muscles results. Remaining quiet will cause almost immediate cessation of the pain. Cramps in the muscles are also common and call for massage in order to stimulate the circulation.

The Diagnosis of Arteriosclerosis. Diagnosis of the existence of hardening of the arteries is usually not a difficult matter. In some cases especially where the condition affects the aorta alone or the aorta and some of the largest arteries only, the use of the x-ray is called for. Depending upon the blood pressure alone is not always a safe procedure in attempting to corroborate the diagnosis as in many cases the blood pressure varies at different

times and so at the time it may be taken it may be not high or may even be normal or below normal. One may often get a fairly good indication of the condition of the arterial system by feeling the radial artery at the wrist or the temporal artery at the side of the forehead. When there is a fairly well developed arterial hardening these arteries will be hard to compress, will feel harder than they should and will often roll beneath the finger like a hard lead pencil.

The x-ray is very valuable in determining the amount of calcification of the vessels of the extremities and of the aorta.

It is a fact that arteriosclerosis is the cause of death either directly or indirectly of a very large proportion of those who live past middle life. Systemic toxemias have gradually developed through the years, which have poisoned the system and produced structural changes in various organs of the body. The arteries feel these changes as much if not more than any other parts of the body and in the last analysis it will be found that in cases of arteriosclerosis most of the organs of the body have become pathological due to the condition of the arteries supplying them with blood.

The Treatment of Arteriosclerosis. The disease having developed, what can be done about it? What steps can be taken to either eradicate it completely or at least bring it under control so that life may be prolonged and comparative if not perfect health be enjoyed during the remainder of that life?

Of course there are a number of factors which must be taken into consideration before such a question can be

answered. In the first place one has to consider the age of the patient; the older one is the less can one be expected to be able to do for him or her. Yet it must not be forgotten that there are many in their seventies and even eighties who are still enjoying life yet whose arteries are quite seriously affected. This is largely because they recognize their condition and are taking care of themselves rather belatedly but still in a very satisfactory manner and are thus preventing the further development of the disease or even to a certain extent bringing about some amelioration of their condition. Many of them are mentally very much alert and physically strong. In such cases it may usually be said that the disease has not developed until late in life. Those who are affected with hardening of the arteries before middle life are not apt to do as well or to live as many years as those who do not contract the disease until late in life.

Other factors to be considered in addition to the age of the patient are, the extent to which he or she is affected at the time treatment is begun, the amount of kidney or heart complications which may have developed, the length of time the disease has existed, the general mental and physical condition of the patient, his family history, his background, and his occupation. A man who comes from a strong, long-lived family, a man in whose family there does not seem to be any hereditary tendency toward hardening of the arteries, a man whose occupation is one that he can pursue without excitement, worry or mental or physical strain, a man who can so arrange his life that he can take good care of himself and live a simple and correct life, will be able to do extremely well

even though he is quite seriously affected. By proper living it is always possible to retard or to arrest any further deterioration. All this is quite as true of woman.

It must of course be remembered that arteriosclerosis is a disease which is perfectly preventable but a disease which, when it has existed long enough to cause structural changes in the arteries and in some of the vital organs, it is generally impossible to entirely eradicate though it can be checked and made so much better that the symptoms will to a great extent be dissipated and life will again be worth living.

The Elimination of Toxins Important. The secret of the treatment of this very chronic and distressing disease lies in the elimination of accumulated poisons and toxins from the system and the regulation of the life of the patient in such manner that toxemia will not reoccur allowing the damaged tissues to become rehabilitated and made as near normal again as is possible. As a heavy protein diet, lessened skin activity, constipation, the use of alcohol, the presence of localized infections from bad teeth, diseased tonsils, a diseased appendix, in man an infected prostate gland and in woman a bad ovary, together with overwork and worry, are all contributing and exciting causes of arteriosclerosis, they must all be taken in hand and corrected where they exist in order to get any satisfactory results from the general treatment of the disease.

Plethoric individuals who are full blooded, with fat, red faces are usually large eaters of meats, rich foods and often large consumers of alcoholic beverages. These individuals are in need of special attention. They will

often be found to have high blood pressure even though they feel perfectly well, or say that they do, and will scoff at the suggestion that they should take better care of themselves. But the full-blooded person is not the only one who needs looking after. The majority of people are inclined to think that it is only such full-blooded people who develop the disease but this is not the case. The thin individual who has a dry and wrinkled skin and unsatisfactory eliminations will often be found to be affected with hypertension and will need as much looking after as the other class of individual.

Arteriosclerosis being a constitutional disease in which there is a poisoning of the bloodstream and in which the eliminations are usually not satisfactory, the methods of treatment adopted are with a view to the purification of the bloodstream and the restoring of a proper chemical balance to the blood. This means that eliminative measures are called for as being of the utmost importance.

The Fast. In probably no disease is fasting more valuable than in hardening of the arteries and it is in all cases the first measure to be adopted in the line of treatment. The length of the fast will depend, of course, upon the weight and the general condition of the patient. If of normal weight and good physique a fairly long fast can be taken to advantage. In such cases a complete fast is adopted and may be continued for from ten to twenty days depending upon the reaction of the patient to the fast. In a complete fast one abstains from any and all food, nothing but water being permitted to be taken.

The faster can, however, take as much water as may be desired. As a rule there is no particular desire for water

felt during the first day or two as the faster is using up his own body fluids. However at least four glasses of water should be drunk daily during the first two or three days and this amount is to be later increased to seven or eight glasses or even more each day. Plain water often has a bad taste to a person on a fast not that there is anything wrong with the water but because there develops a bad taste in the mouth of the faster which he attributes to the water. In such cases a few drops of lemon juice added to the water will overcome the trouble.

The longer the fast the better the result and if it can in certain cases be continued for two or three weeks it should be done.

Fast-breaking Routine. At the completion of the fast a fast-breaking diet is inaugurated for a few days depending upon the length of the fast. The longer the fast, the longer the fast-breaking routine is to be continued. Very short fasts require no more than one day of a fast-breaking routine while longer fasts make a fast-breaking routine of two or three days and in some cases even longer very advisable.

There are several fast-breaking diets which may be adopted to advantage.

For a short fast of from two to five days a very good fast-breaking diet is as follows: On the first day three meals of orange juice or other fruit juice taken about five hours apart. In some cases the entire orange exclusive of the skin, seeds and tough fibrous sections may be eaten. Instead of oranges, grapefruit, apples or peaches may be taken if desired. On the second day one glass of sweet milk may be taken every hour for ten hours with

the juice of one orange taken half an hour before the first glass of milk. If one cannot take large amounts of milk as sometimes happens, one may take three meals during the day composed of citrus fruit or sweet fruit and one glass of sweet milk. The milk may be taken cool or hot but never ice-cold.

After longer fasts a good routine consists of the juice of one orange or other citrus or juicy fruit or six ounces of vegetable broth three or four times on the first day and on the second day the same as the first except that twice the amount of orange juice or other fruit juice or vegetable broth may be taken. If other fruit juice is taken the amount must be equivalent to the juice of one large orange and no more. If desired the pulp of the orange may be eaten. On the third day one glass of milk every two hours is taken. This is to be drunk very slowly sucking it into the mouth so that it will become mixed with the saliva. Only small quantities are taken into the mouth at each swallowing. Orange juice may be taken before the first glass of milk if desired. On the fourth day the routine is the same except that milk is taken every hour instead of every two hours. Where milk cannot be taken vegetable broth may be substituted.

While the above fast-breaking routines will usually answer in the majority of cases they may in special cases have to be somewhat modified to suit each particular case.

The Milk Diet in Hardening of the Arteries. After the discontinuance of the fast-breaking routine an exclusive milk diet is often of the very greatest value but the daily amount of milk ingested must in cases of arterio-

sclerosis usually be kept down to four quarts daily or in some cases even less for an average sized individual. It is possible that even this amount of milk may add to the weight of a person who is of normal weight or is overweight. An increase in weight is generally considered as a disadvantage in these cases but the milk diet has such a beneficial effect upon the arteries as a rule that added weight must sometimes be overlooked to a certain extent. Milk helps to dilute the blood which thereupon regains its ability to reabsorb some of the elements deposited in the walls of the blood vessels and this may frequently incline to modify the symptoms of the complaint. The taking of too much milk may however have a tendency to add too much fluid to the blood and make undue pressure upon the arteries. Therefore the amount specified above should be used and no more at least until decided improvement in the general condition of the patient has been secured.

Certain individuals on account of a susceptibility or idiosyncrasy or allergic tendency cannot take large quantities or sometimes even the smallest quantities of milk without developing most unpleasant and discomforting symptoms. When this is the case either a combination milk and fruit diet may be substituted for the exclusive milk diet or a diet which excludes milk entirely. The milk and fruit diet may consist of three meals daily of one or two pints of milk taken very warm, with as much acid fruit as may be desired. Acid fruits are apples, oranges, grapefruit, peaches, pears, blackberries, strawberries, etc. Any of these fruits may be taken with the milk. It is well to alternate the fruit and milk, drinking

one glass of milk and then eating a little of the fruit, then drinking another glass of milk, and so on.

Some persons do exceedingly well by taking a milk diet for a few weeks, then changing to a simple fruit diet for a few days, returning again to the milk diet and alternating in this way for a considerable period of time. A very good fruit diet is as follows:

Breakfast : One grapefruit ; three steamed figs.

Luncheon : One apple ; three or four dates.

Supper : One pear or one banana.

One may vary the juicy fruits and the sweet fruits from day to day.

After the fast-breaking routine has been discontinued and one of the above diets instituted it is an excellent plan for a sufferer from hardening of the arteries to adopt a complete fast one day a week drinking a good deal of water upon that day but taking no food. It is also a good plan for him or her to remain quiet on that day and secure as much complete relaxation as possible, and also give the digestive apparatus a rest. Complete absence of food from the stomach for a short period at regular intervals helps considerably to prevent the accumulation of waste products in the intestinal tract.

General Diet. After the discontinuance of the exclusive milk diet or the fruit and milk diet and one is prepared to return to a regular diet certain very important matters have to be observed.

In the first place overeating must positively be avoided. One should eat less than one has the inclination for and should rise from the table with the feeling that he could

eat and enjoy considerably more. When food is ingested the heart action becomes greatly stimulated and its pulsations much stronger, thus propelling the blood much more forcibly through the arteries. If any of the smaller arteries are extremely brittle from calcareous deposits and especially if this be the case with the arteries of the brain the result may be serious as there may be danger of a rupture of one of these small arteries, producing a cerebral hemorrhage or an apoplectic stroke.

Again, overeating distends the stomach and if several varieties of food are eaten there is apt to be a considerable amount of gas generated in the stomach which will so distend it as to cause undue pressure upon the diaphragm which in turn causes pressure upon the heart, interfering with its action to a certain extent and frequently inducing attacks of palpitation or extremely rapid heart action. This often produces much distress. The regular diet should consist very largely of fruits and fruit juices, fresh green vegetables, raw or cooked, vegetable and fruit salads, milk and other dairy products when they can be taken, some whole grain products and such dried fruits as figs, prunes, raisins, dates and occasionally a few nuts. It is of importance to select vegetables which are of low starch content at first using those containing not more than ten per cent carbohydrates. The vegetables which are eaten cooked should be steamed in their own juice in a steamer and the juice taken as well as the vegetables. No salt should be added to any articles of food as the diet should be salt-free.

Tea, coffee and cocoa should be avoided. One of the various coffee substitutes or some caffeine-free prepara-

tion of coffee is to be taken instead. Tea, coffee and cocoa contain a poisonous alkaloid, caffeine, which while a primary heart stimulant is a secondary heart depressant. When large quantities of tea or coffee or cocoa are taken for protracted periods of time they tend to have a very deleterious effect upon the system affecting the action of the heart, impairing the appetite and producing a very enervating effect upon the nervous system.

On account of their effect upon the heart action and upon the circulation they should be avoided. In addition these beverages tend to increase or cause insomnia.

The use of alcohol and tobacco is also to be strictly interdicted. Alcohol is apt to overstimulate the heart action and greatly increase the force of the pulse beat and may have the same effect upon brittle arteries that may come from overeating. Tobacco will cause palpitation and irregular heart action and in some persons will cause a considerable rise in the blood pressure.

Constipation to Be Avoided. Constipation is to be avoided. Straining at stool is often followed by serious results as it usually sends an oversupply of blood to the head producing a certain amount of congestion which may be productive of more or less bad results. As a general rule the bowels can be made to function freely and satisfactorily by diet alone. The use of leafy green vegetables containing bulk in the form of cellulose will usually be sufficient to produce adequate bowel movements. In some cases the taking of foods containing some roughage is of value. Such foods are the whole grain products. Cracked wheat is one of the very best of these products. There are some persons who cannot take any great

amount of roughage because it produces in them a certain amount of intestinal irritation. Too much roughage is not good for any one but a certain amount of it is of value especially where there is a tendency to constipation. The following is a partial list of foods which are of value in overcoming constipation:

Asparagus	Currants	Parsnips
Beet tops	Dates	Plums
Bran	Figs	Raspberries
Carrots	Huckleberries	Spinach
Cauliflower	Kale	Squash
Chard	Lentils	String beans
Chicory	Onions	Turnip tops

In addition to the diet, abdominal massage, the drinking of a good deal of pure water, the taking of an occasional enema or colonic irrigation, or the use of moderate doses of mineral oil or agar agar are additional measures which are of value in overcoming constipation or preventing its occurrence.

Rest and Relaxation. Those who have arteriosclerosis should retire early and should remain in bed for at least ten hours each night whenever possible. In addition it is of great advantage to, if possible, lie down or recline in an arm-chair for an hour or two once or twice a day relaxing completely not only physically but mentally. The mind should be made as much of a blank as possible. A further good plan is, as mentioned above, to remain in bed one day a week where this can be done. This can very well be the day upon which the one-day weekly fast is taken.

Dangers of Over-Excitement and Sexual Indulgence. The avoidance of excitement of all kinds is imperative. One should live as even and as simple a life as can be arranged, and should be free from emotion and tension of any kind. Sexual indulgence must be most moderate and if it produces irregular or abnormal heart action, shortness of breath or a hacking cough with the occurrence of wheezing sounds or bubbling in the chest, it had better be avoided altogether. Sexual excitement is frequently productive of severe results as the general congestion induced is apt to put too much of a strain upon the heart and the blood vessels. One has always to keep this in mind when affected with arterial disease.

Value of Moderate Exercise. A certain amount of regular, systematic exercise is of the greatest value in cases of arteriosclerosis the amount and character of which depends entirely upon the extent of the disease and the actual condition of the heart and arteries. Walking is of course one of the best forms of exercise which can be taken by sufferers from this disease. It is to be recommended even in cases where calisthenics and other forms of exercise are forbidden. In taking walking exercise one begins by attempting only very short walks at a rather slow pace. As one continues the walking one gradually increases both the pace and the distance with the improvement in one's general condition. For some little time walking on level ground only should be allowed but later on walking up slight grades will be permissible, gradually increasing the steepness of the grade as one feels able and can take them without distress. But the moment headache, breast pain, shortness of breath or

any dizziness occurs or there is any considerable throbbing of the temples or rapid or irregular heart action one should immediately stop walking and sit down or lie down and relax until these symptoms disappear. And no more walking is to be done until one feels perfectly able to continue. These symptoms are danger signals and *must be heeded.*

Mild calisthenics may also be indulged in to advantage in the majority of cases. Deep breathing is also an excellent form of exercise as it gently stimulates the circulation, increases oxygenation of the blood and aids metabolism. If, however, active exercise proves to be not advisable, passive exercise and massage given by an attendant may be substituted to advantage. When possible all exercise should be taken in the open air.

Hydrotherapy and Electrical Treatment. Hydrotherapy or treatment with water in various ways is of the greatest value in cases of arteriosclerosis. Such treatment may take the form of warm baths, sweat baths, and cabinet baths. Hot water baths may be given in selected cases only and where the condition is not severe. Whenever a warm or a hot bath is given it should always be followed by a cool sponge or shower or sponge and generally by a light rub. When an electric light cabinet bath is given it is always advisable to apply a wet towel to the head turban fashion.

A sweat bath should never be taken within an hour before or two hours after a meal. Complete drying should follow a sweat bath and as a rule it should terminate with a period of perfect relaxation for from one-half to one hour. If the reaction from a sweat bath is good, if a

cold bath or cold sponge has followed it, and if sweating does not return after the cold bath, it is advisable to walk in the open air for a little while or to take some mild light exercise. A sweat bath may be obtained by taking a hot air cabinet bath, an electric light cabinet bath, a Turkish or a Russian bath, a vapor bath, or a sweat pack.

The use of electricity in the form of autocondensation or high frequency current is often very helpful in many cases but should only be taken on the advice of a doctor as there are many cases in which these forms of treatment may be inadvisable.

CHAPTER FIVE

Waste Elimination After 40— The Kidneys

THE excretion of waste products, toxins and poisonous material generated in the body is accomplished through four separate channels. These are: The intestinal tract, the lungs, the skin, and the kidneys.

Elimination Through the Intestinal Tract. Digestion takes place partly in the stomach but principally in the small intestine. Digestive nutrient material is taken up in the small intestine by means of the lacteals, the central vessels of the little projections called villi which are found in abundance in this portion of the intestinal tract, and it eventually finds its way into the general circulation. Ingested material that is not digested passes from the small intestine into the large intestine or colon where it becomes more or less solid in consistence, and, after reaching the rectum, is discharged in the form of what is known as feces.

Failure to eliminate this fecal waste—in a word, constipation—is an obstacle to health, and one often encountered after forty. Constipation, indeed, is one of the chief sources of various ailments of middle life discussed in this volume. Methods for overcoming this destructive condition are discussed in these pages in detail in relation to these ailments.

Elimination Through the Lungs. The lungs are important organs of excretion and discharge poisonous carbonic acid gas or what is known as carbon dioxide generated in the process of metabolism. Inspired air contains the following gaseous elements:

Carbon dioxide03
Oxygen	20.94
Nitrogen	79.03

Expired air contains:

Carbon dioxide	4.00
Oxygen	16.00
Nitrogen	80.00

It will thus be seen that while the amount of nitrogen in both inspired and expired air varies less than one part in one hundred, the carbon dioxide expired is far in excess of the amount that is inspired. As to oxygen, twenty parts are inspired and sixteen parts expired, showing that four parts are taken up in the processes of combustion in the tissues of the body.

Elimination Through the Skin. Another important means of excretion of waste material is through the skin. The amount of skin surface of the average individual is from fifteen to twenty square feet. This surface is full of pores, more numerous in some portions of the skin than in others but present in some degree in practically every part of the skin of the entire body. These pores are the openings or mouths of the ducts of very small glands situated in the deeper portions of the skin. These glands are of two varieties—the sweat glands, known as sudorifer-

ous glands, and fat glands, known as sebaceous glands. The total length of these glands and their ducts is estimated to be about eight miles. This will give some indication of the importance of the function of the skin as an excretory agent.

The skin is itself really a great gland. The excretion from the fat or oil glands serves to keep the skin moist and pliable and also to nourish the skin and keep the hair from becoming too brittle. The sweat glands, of which it is estimated there are more than 3,500,000, are constantly in action. They excrete what is known as perspiration. The perspiration contains impurities which are poisonous to the system and consist of moisture, fatty acids, solids, urea and some carbon dioxide. Should anything happen to prevent the formation of perspiration in all parts of the body at the same time or should anything happen to prevent the perspiration from being discharged death would ensue within a comparatively short time. It will thus be seen that the skin is a most important source of excretion.

Elimination Through the Kidneys. The kidneys are the organs by means of which the larger part of the broken down and waste material of the body itself is eliminated. Such waste products are extracted in the kidney from the blood and discharged in the urine.

As to their structure and their work, the kidneys are two organs shaped somewhat like what are known as kidney beans. They are situated in the lower part of the back, one on each side of the spinal column. They are normally imbedded in heavy fat which helps to retain them in their proper position. The right kidney lies somewhat

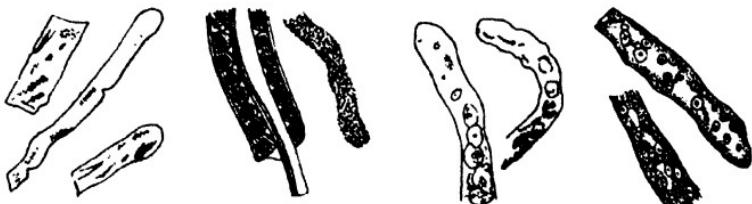
lower than the left. Each kidney is about four inches long, two inches broad, and one inch thick. The left kidney is generally somewhat larger than the right. In the male the kidneys are usually slightly larger and heavier than in the female, weighing from $4\frac{1}{2}$ to 6 ounces each in the former, and from 4 to $5\frac{1}{2}$ ounces each in the latter. Taken together the kidneys make up about $\frac{1}{240}$ of the entire body weight. They lie facing each other with their concave surface toward the spine and their convex surface facing outward.

Blood vessels and nerves enter the kidney at the middle of the concavity and there arises from this point a tube called the ureter, which carries the urine from the kidney to the bladder. Each kidney is covered on the outside by a fibrous membrane closely attached to its surface and which is known as the *capsule* of the kidney. This fibrous membrane tips into the interior of the kidney at its concavity and forms the framework of that organ. The outer portion of the kidney is composed of a narrow band of tissue called the *cortex*. This is made up of innumerable small twisted tubules, each one of which arises in a very minute spherical hollow capsule containing a number of capillaries and small blood vessels. The central portion of each kidney is composed of bundles of very small straight tubes. These bundles, which vary in number from 8 to 18 in each kidney, are shaped like pyramids, with the pointed ends projecting into an open space in the interior of the kidney called the *pelvis* or *reservoir*. In the tip of each pyramid is to be found the opening of a duct formed by the union of several of the straight tubes mentioned above. The fibrous capsule al-

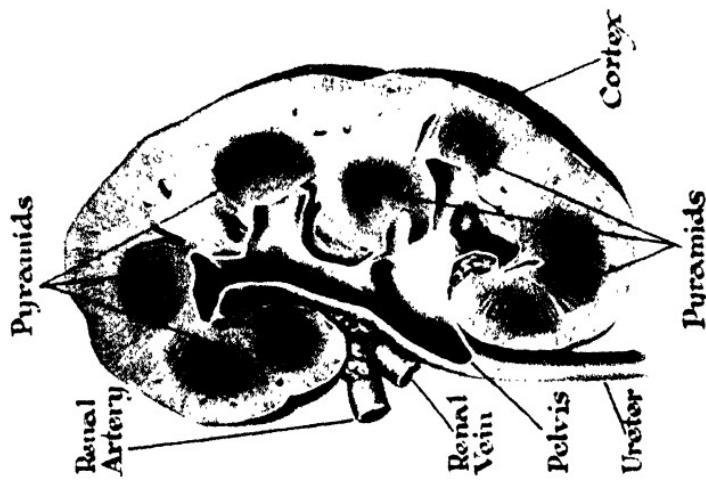


SECTIONAL ILLUSTRATION WITH PROSTATE AND RELATED PARTS

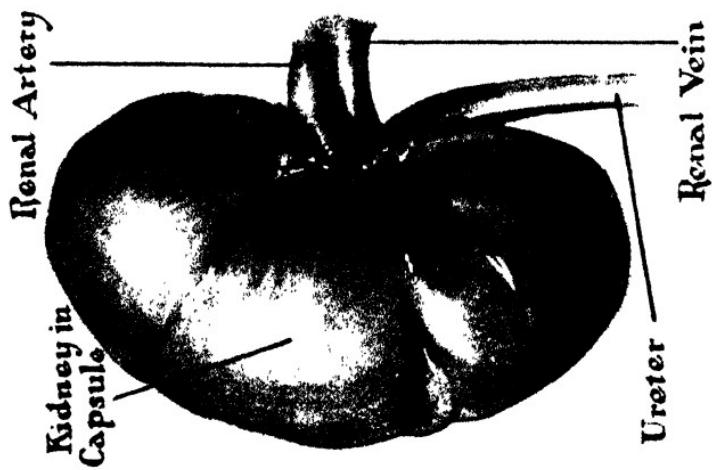
- 1 Vas deferens
- 2 Pubic bone
- 3 Bladder (muscular coat)
- 4 Prostate gland (with dotted line indicating course of urethra)
- 5 Seminal vesicle



Hyaline Casts Granular Casts Epithelial Casts Blood Casts
Types of kidney casts found in human urine, greatly magnified



Cross section of kidney



Exterior view of kidney

ready described dips down into the interior of the kidney and forms the lining of the pelvis.

The ureters, already mentioned, arise from the pelvis of each kidney and pass downward, opening into the bladder.

Circulation of the Blood in the Kidney. In order to understand the function of the kidney it is necessary to explain the circulation of the blood within that organ. The main artery of the kidney called the renal artery, is a branch of the main artery of the trunk, the aorta. The renal artery on its entrance into the kidney divides into five branches. These branches pass up between the pyramids and subdivide several times, finally terminating in two sets of very thin-walled capillaries. One of these sets occupies the cavity of the minute spherical capsule, while the other set ramifies around the twisted and the straight tubules, described above.

The blood enters the kidney through the renal artery, fills the two sets of capillaries and passes from them into small veins which join each other as they descend between the pyramids and finally form what is known as the renal vein. This vein leaves the kidney at the same point that the renal artery enters it. The renal vein discharges into one of the largest veins in the interior of the body called the vena cava inferior. The blood which circulates through the kidneys comes therefore directly from the largest artery in the body and is discharged into the largest vein in the body.

Elimination of Waste Products by the Kidneys. The manner in which the kidney disposes of waste material is as follows:

As the tissues all over the body break down they are dissolved in the blood and carried in the general circulation to the liver and this broken down tissue is chemically changed in that organ and made ready to be filtered out of the blood by the kidneys. Of the waste material in the blood the most important and the most noticeable is what is called *urea*. Urea is a poisonous nitrogenous substance, the product of the breaking down of the tissues, a process known as *katabolism*.

The extraction of this poisonous material is carried on in the tiny convoluted or twisted tubules in the substance of the kidney. The fine capillary blood vessels which are found surrounding these tubules contain the waste material. By a process known as *osmosis* the watery constituents of the blood containing this waste material pass from the blood through the walls of the capillaries and into the tubules whence this waste finds its way into the straight tubes in the pyramids of the kidneys and is discharged into the pelvis in the form of urine which then passes from the pelvis into the ureters and thence to the bladder to be voided in the act of urination.

Urine in Health and Disease. Human urine is a transparent, limpid fluid, with a mild characteristic odor. The amount of urine normally voided daily varies between forty and fifty ounces, the quantity depending largely upon the amount of fluids ingested, the amount of perspiration, the temperature and moisture of the surrounding atmosphere, increase or decrease in the blood pressure, and the presence or absence of certain diseases, such as nephritis or inflammation of the kidney, diabetes, the state of the nerves, and the absorption of fluids from

dropsical swellings in the body, as well also as from the taking of certain drugs called diuretics.

As a rule, little or no urine is passed during the night by normal, healthy individuals, unless a good deal of fluid has been drunk late in the evening. Under certain abnormal circumstances, however, one may pass considerable urine during the night. During the day the urine is as a rule, voided about once in every four or five hours. When an abnormal amount of urine is passed during the day and night the condition is termed *polyuria*. The passing of abnormally small amounts of urine is termed *oliguria*. The latter condition may come from many causes, principal among which are the presence of fever or elevated temperature, excessive perspiration, loose and watery bowel movements, certain diseases such as some types of kidney trouble and heart disease, obstruction of the urinary passages as by kidney stone, and cases of hypertrophy or enlargement of the prostate gland.

The normal color of urine is light amber. This color is due to the presence of a pigment called *urochrome*. One cannot judge the presence or absence of disease from the color of the urine because in many diseases the color is not altered continuously. Urine which is very pale or very dark or which looks bloody or greenish, or even black in color, is usually abnormal. In addition to the pigment the urine may become changed in color due to concentration. Normal urine has an acid reaction, this being due in a large degree to the presence of acid sodium phosphate and organic acids. A highly acid urine may be caused by faulty diet, or by the fact that perspiration concentrates the urine.

Many persons have the idea that the acidity of the urine depends upon the amount of uric acid present, but this is an erroneous belief.

It frequently happens that the urine passed soon after a meal may have an alkaline instead of an acid reaction, and this may be due to the withdrawal of certain substances from the blood for the protection of the acid of the gastric juice, but it may also be due to a strictly vegetable diet or from the presence of bacteria which causes decomposition of the urine, or the presence of pus, or from the taking of certain alkaline medicines.

Normal urine, as compared with water, is of greater weight. Its specific gravity ranges from 1.015 to 1.025 ounce. This specific gravity, when large amounts of urine are passed possibly may decrease, just as it may increase when only small quantities are passed the specific gravity is apt to be higher, owing to concentration at the time and the presence of more solid material than in the case where large quantities of diluted urine are passed. The specific gravity indicates the amount of solids that are in solution in the urine. In some forms of nephritis the specific gravity is low, while in other forms it is high. In diabetes as well as in some other abnormal conditions, the specific gravity is regularly high.

The odor of urine is characteristically aromatic, though this may be changed very materially by the taking of certain foods. The urine of a person who has been eating asparagus, garlic, and certain other articles of food, will have a distinctly different odor from the normal, according to which article of food is eaten.

Normal urine is 95% water, the other 5% being made up of urea, uric acid, urates, creatinine, extractives, and inorganic salts, such as the chlorides, the phosphates, and the sulphates of sodium, calcium, potassium, and magnesium.

Urea is composed very largely of nitrogen. It varies in amount with the diet and in certain diseases. People who eat food which is largely protein in character are apt to have considerable urea in the urine. It also is present in excess in most cases of diabetes, gout, rheumatism, and fevers. When people drink large amounts of liquid and take an insufficient amount of nitrogenous food the amount of urea is usually lessened.

Uric acid is a compound which is derived as a rule, from certain foods, such as meat, and some other foods. The formation of uric acid is rather complicated, but it usually is found in the urine as the result of faulty diet, or faulty nutrition.

Urates are the salts of uric acid and a very small quantity is often found in normal urine, usually when the urine is concentrated. They also are apt to be found where excessive protein food is taken and when uric acid is present.

Creatinine is a substance formed by the destructive metabolism of muscular tissue.

The *inorganic salts* found in urine are obtained from the foods eaten.

Certain diseased conditions as well as the ingestion of certain foods will cause variations in the amount of different solids to be found in the urine.

Abnormal Substances Found in Urine. Abnormal

substances which are found in the urine in various functional and organic diseases are: albumin, sugar, bile, pigment, acetone, diacetic acid, indican, cylindroids, pus, leucocytes, blood, spermatozoa, yeast cells, casts, and various epithelial cells. Bacteria are also found in certain specific diseases and some forms of these micro-organisms are found in urine which is decomposed.

While indican is an abnormal constituent of the urine, a trace of this substance is often present in normal specimens, as are also squamous epithelia from the bladder, an occasional leucocyte and a very slight amount of mucus.

In certain diseases, especially some types of disease of the kidneys, albumin will be found in the urine. Albumin is a protein substance which is not found in normal urine. It is one of those substances which is looked for when kidney disease is suspected, although there are some forms of this disease in which albumin is not always present, or may be present in only very small quantities.

Sugar is a carbohydrate and produces energy and heat in the body. It is another substance, the constant presence of which in the urine indicates an abnormal condition, generally that of diabetes. Sugar will, however, occasionally appear in the urine due to altered function of the liver or intestines. It is present sometimes in the urine of people who are extremely nervous, or who are affected with certain nervous diseases. Occasionally it is found in the urine of pregnant women.

Blood is found in the urine in certain diseases of the kidney, in stone in the kidney, ureter or bladder, also when certain growths are present in these parts of the

urinary tract. It is frequently present in acute nephritis, and in tuberculosis of the kidney.

Bile pigment is formed in the liver. When present in the urine it is generally due to some obstruction of the bile ducts, preventing the discharge of bile into the intestinal tract.

Indican may result from putrefactive and fermentative changes in the intestine, and is usually due to the putrefaction of nitrogenous foods. It also is found in certain pulmonary and pleural conditions, as well as in disease of the gall bladder, typhoid fever and child-bed fever.

Acetone when present in the urine usually denotes the existence of diabetes in a well-developed form. It is also found in cases of intestinal toxemia, and in people who are fasting, or who are starving as the result of malnutrition.

The presence of diacetic acid usually indicates a severe form of diabetes. It is also found in some cases of auto-intoxication and in fevers and when occurring in diabetes, usually denotes a very critical condition—its presence in the urine usually being promptly followed by the occurrence of coma.

Pus is an indication of inflammation somewhere in the urinary tract. Occasionally a few pus cells are found which may be due to a transient condition.

All the above mentioned changes in the urine can be readily determined by certain chemical tests.

There are other changes in the urine in diseased conditions which can be determined only by a microscopic examination. There are many persons who are more or

less familiar with the use of the microscope and to these persons such examinations will come easy.

Most of the abnormal constituents of the urine which are detected by the microscope are indications of diseased conditions of the kidneys, though some of the various forms of crystals found may have no relation to any abnormal state of the kidney. These crystalline substances will not be discussed here.

Among substances found under the microscope which indicate an abnormal state of the kidneys are what are known as *casts*. There are different varieties of casts, such as tube casts, blood casts, epithelial casts, fatty casts, granular casts, hyaline casts, pus casts, and waxy casts. Several types are illustrated in the plate facing page 112.

Tube casts are tiny molds of the tubules of the kidneys and vary in character, according to the particular abnormal condition of those organs. They are generally composed of albumoid substances but they often contain other substances in addition. Their presence generally indicates a certain condition of the kidney. These casts are very small and are generally straight, though they may be slightly curved or twisted in shape.

Blood casts are composed of coagulated blood and blood cells and indicate some hemorrhagic condition of the kidney.

Epithelial cells are really hyaline casts covered and infiltrated with epithelial cells from the kidney. They indicate serious damage to the kidney structure.

Fatty casts are composed of coagulated material in which are found small oil globules. They indicate more or less disintegration of certain portions of the kidney.

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Granular casts are made up of coagulated material and granulated debris. These casts are found in most cases of chronic nephritis or Bright's disease.

Hyaline casts are composed largely of mucus. They are transparent, glassy and crystalline in appearance. They are present in all organic diseases of the kidneys. They are also found in certain other conditions, such as fevers, after strenuous exercise, in congestion of the kidney, and sometimes after ether anesthesia. They are of most significance when found in the interstitial form of chronic Bright's disease.

Pus casts are small casts containing pus and are found principally in acute inflammation of the kidney.

Waxy casts are large and yellowish in color, and are present in chronic Bright's disease and indicate a serious condition of the kidney.

Tubercle bacilli and *spermatozoa* are present in the urine under certain special conditions only.

Yeast cells are sometimes found in the urine of persons who have been indulging in large quantities of starchy or sugary food, but as a rule, they do not constitute an abnormal condition of the kidney.

Simple Home Tests for Bright's Disease and Diabetes. Persons suffering from Bright's disease and from diabetes can often keep informed of their condition to a certain extent by noting abnormalities in the urine. Certain simple chemical tests will enable one to determine the presence or absence of albumin and sugar.

In order to make these chemical tests of the urine a certain amount of apparatus and chemical reagents are needed. The apparatus consists of a number of test

tubes, a pipette, an alcohol lamp or a Bunsen burner, and usually a wooden appliance for holding test tubes. Litmus paper, both red and blue, a glass funnel and a urinometer are also important.

Test tubes are narrow, glass tubes with a round bottom. They should be made of annealed glass. They are manufactured in various sizes, but a good average size is one which will hold about three-quarters of an ounce of fluid.

The pipette is a glass tube about the size of a paper straw, one end of which is made to taper so that the opening is just large enough to allow fluids to pass through it easily.

The test tube holder is usually made of wood and is used to hold test tubes over the flame, otherwise one will be apt to burn one's fingers. Both test tubes and test tube holders are very inexpensive.

A urinometer is a mechanism for telling the specific gravity of the urine.

Litmus paper is paper soaked in certain chemicals and used for telling the reaction of the urine, that is to say, whether it is acid, neutral, or alkaline, and in a general way it will tell whether the acidity and alkalinity is mild or strong. There are two kinds of litmus paper—red and blue. In order to test the reaction of the urine a small piece of red litmus paper is dropped into the urine specimen. If the reaction is acid, the color of the litmus paper will not change, unless it is extremely acid, when the red color will become more pronounced. If the urine is alkaline, the red paper will turn blue. If the urine is neutral, no change in color is observed. When blue litmus

paper is dropped into acid urine the paper will turn red. If the urine is alkaline, no change occurs, unless it is extremely alkaline, when the blue color will become somewhat more pronounced. If the urine is neutral there will be no change in color.

An alcohol lamp may be purchased very cheaply in most drug stores.

If one uses illuminating gas in the house a Bunsen burner may be obtained. This produces a great deal more heat than an alcohol lamp and heats the specimen much more rapidly, saving a considerable amount of time, but as the heat is more intense, one has to be very careful not to crack the test tube.

An ordinary gas flame cannot well be used as it will cover the outside of the test tube with soot which interferes with the proper inspection of the contents of the tube. In the Bunsen burner the gas is mixed with air and no soot is formed on the tube.

In some cases it is well to filter the urine before making the test. For this purpose filter paper can be bought and folded into a cone of suitable size to fit the inside of a glass funnel, the end of the funnel being stuck into the test tube. The urine is poured slowly into the funnel and it filters through the filter paper into the tube. This clears the urine of a good deal of mucus and other material which might obscure the test. If filter paper cannot be procured one may put a little absorbent cotton in the bottom of the funnel and pour the urine slowly upon the top of the cotton. This, however, is a very poor substitute for filter paper and does not work out in nearly as satisfactory a manner.

In cases of Bright's disease the tests are made for the purpose of discovering the presence or absence of albumin in the urine.

The two tests most commonly in use are what are known as the heat and nitric acid test, and Heller's test.

The heat and nitric acid test is applied as follows: About four or five ounces of urine are placed in a bottle and slightly acidulated by dropping one drop of chemically pure nitric acid into the urine. This is shaken up and a test tube filled one-third full of this urine and boiled over the flame of the alcohol lamp or Bunsen burner. A white deposit may develop in the tube. Nitric acid is now added, a drop at a time, at intervals of a few seconds between each drop. If, after a few drops have been added, the white deposit still remains, it indicates that it is composed of coagulated albumin. If, however, too much nitric acid is added to the urine the white deposit will disappear.

Possibly a better and more reliable test is Heller's test. This is performed as follows: A small amount of nitric acid is placed in a test tube. It is well to use the glass pipette for this purpose as pouring the acid into the tube will allow some of it to be left on the glass on the inner surface of the tube. After the nitric acid is placed in the bottom of the test tube an equal amount of urine is allowed to run into the tube slowly so that it will not mix with the acid but will remain on top of it. This can be accomplished by holding the test tube obliquely and allowing the urine to run along the inner side of the tube, using a pipette for this purpose. In passing the urine through a pipette the pipette is first placed in the urine

which will rise up in it. The finger is then placed over the upper opening of the pipette and this will prevent the urine from running out through the lower opening. When the pipette is placed inside the test tube, which is held obliquely, the finger is slightly raised, allowing a few drops of urine at a time to run into the test tube.

This is repeated until the amount of urine in the test tube equals the amount of nitric acid. If albumin is present in the urine a white zone at the line of juncture of the nitric acid and the urine will be seen. The white zone may not appear immediately but if it does not appear until two or three minutes after the test is applied, the amount of albumin is counted as very small, probably not more than $5/1000$ of one per cent. If the ring is heavy and appears quickly the amount is usually quite large. If no ring appears after several minutes have elapsed, no albumin is present.

The nitric acid used for such tests must be chemically pure. It is a powerful caustic and irritant poison and can as a rule, only be procured from a druggist by certifying the purpose for which it is to be used and signing a receipt for poison. It can, however, be procured on a physician's prescription.

Persons suffering from diabetes are interested in the urine tests because they demonstrate the presence or absence of sugar in the urine.

The test most commonly used for this purpose is known as Benedict's test. Benedict's solution is a blue colored solution which can be procured already prepared, or can be freshly prepared at any first-class drug store. It is not very expensive. It is generally dispensed in a blue bottle

as, in order to hold its properties longer and not become changed, it must be kept from the bright sunlight. Benedict's test is applied as follows: An ordinary teaspoonful of the solution is placed in a test tube. To this eight drops of urine is added. One must be sure not to add more than eight drops. The Benedict's solution containing urine is now allowed to boil over a flame for two minutes. It is then set aside and allowed to cool. It must not be artificially cooled, but must cool by standing. If sugar is present the solution will be filled with a precipitate which in color will be red, yellow or green. If no sugar is present, the clear blue color will remain or a faint turbidity may be seen. If no change occurs two more drops of urine may be added to the solution which is again boiled and allowed to cool. This may be repeated several times if necessary. If the red, yellow or green color does not develop no sugar is present.

All of the tests given above are qualitative and not quantitative, that is, they show the presence or absence of albumin or sugar but not the amount of either of these substances that may be present. This latter of course is important but the tests to ascertain exact amounts are delicate and somewhat complicated and require special reagents. When the exact amounts are desired the urinalysis had best be made at a regular laboratory by experienced technicians.

The three tests given above are very easily applied and are of the greatest value, and it is well for persons suffering from either Bright's disease or diabetes to make or have made such tests at regular intervals, the intervals

depending upon the severity of the disease and the presence of any danger signals in the symptoms.

While every disease which may attack a human being cannot be diagnosed by an examination of the urine this seems to be a more or less common belief among the laity. The urine contains certain substances which are normal to it and which are to be found in a chemical and microscopic examination. There are, however, many substances which may be found in the urine which do not belong in normal specimens and these indicate the existence of certain abnormal conditions of the body. While they do not of themselves constitute a sufficient evidence of disease they are of immense aid in diagnosis when taken in connection with certain definite subjective and objective symptoms which the patient may develop. There are a few diseases such as diabetes and Bright's disease in which a fairly positive diagnosis can be made from the results of a urinalysis, but in the majority of diseases a urinalysis is simply an aid to diagnosis, although a very valuable aid.

The urine of every individual varies from time to time in its character, in its amount, and in its constituents. These variations may be entirely within normal limits and may indicate nothing of moment, but there are limits beyond which the variations may not go without denoting the presence in the body of some more or less abnormal condition.

It is to be remembered that the various constituents of the urine are extracted from the blood as it passes through the kidneys and therefore, the composition of the urine depends in large measure upon what is brought

in the blood to the kidneys for extraction and elimination. In the case of disease of the kidneys certain abnormal elements are found in the urine which are produced or developed in the affected kidneys themselves and excreted in the voided urine.

In view of the very important part played by the kidneys in extracting poisonous material from the system and of the fact that almost all of the poisonous urea is excreted by the kidney only a very minute quantity being passed off through the skin, it is easy to understand what the effect of disturbed kidney function will have upon the human system.

Abuse of Kidneys Responsible for Disease. The kidneys, like any other organ of the body, when treated properly will continue to function normally for many years, until they naturally wear out. If, however, a person has not lived correctly and has abused his kidneys by putting too much strain upon them, by eating improper foods which cause large quantities of urea to be formed, thus making the kidney work overtime to excrete this poisonous material, one must expect these organs to wear out, to break down and to become diseased many years before any such result should be expected. The constant strain put upon the kidneys in their endeavor to keep the blood free of accumulated nitrogenous poison will naturally in time prove too much for them. It frequently takes years for the kidneys to develop abnormal conditions. They can stand some degree of abuse but when they do begin to deteriorate structural changes take place within them, which it is hard and frequently impossible to overcome. On account of the

length of time it frequently takes for symptoms of kidney disease to show themselves, these organs are apt to become affected and yet not show any symptoms until at or after middle life. Disease of the kidney is in some of its forms classed as a degenerative disease of middle age.

The Occurrence of Acute Bright's Disease. It must be remembered that kidney disease appears very frequently in young persons, even in children, but we are not discussing these particular cases. Acute Bright's disease occurs frequently as a sequel to some acute infectious disease, such as scarlet fever, infections of the upper air passages, especially infectious cold in the head or throat, tonsillitis, laryngitis and bronchitis. In all other classes of cases the streptococcus germs seem to play an important part, although a general toxemia of the system is almost always present, making it easier for the germs to affect the system. Exposure to cold will sometimes cause the development of acute Bright's disease but this too is usually only an exciting cause of the disease in a person who is already toxic. In rare instances syphilitic infection has been the cause of the development of attacks of acute inflammation of the kidneys.

Pregnant women sometimes develop an acute form of Bright's disease and uremic poisoning but this is considered by many as a toxemia of pregnancy rather than as a true nephritis for unless much damage has been done to the kidney the termination of a pregnancy, either naturally or artificially when considered necessary, will be followed by prompt recovery, though in some cases an abnormal condition of the kidneys may persist for a long

time, possibly resulting in chronic disease of these organs.

The ingestion of certain poisonous chemicals such as bichloride of mercury, arsenic and lead may cause disease of the kidneys, but in many cases of acute Bright's disease no definite cause can be assigned though it may be said that a systemic toxemia is practically always present in such cases as well as in chronic kidney afflictions.

While it was formerly thought that chronic disease of the kidneys usually resulted from an acute attack, it is now asserted by many of the best medical authorities that this is rather rare and that nearly all cases of chronic kidney disease develop insidiously and are practically chronic from the very beginning. It is important to know that changes in the arteries in the form of hardening or what is known as arteriosclerosis are present in the majority of cases of chronic Bright's disease and are largely responsible for the disturbed functions of the kidneys.

How Bright's Disease Acquired Its Name. The name Bright's disease is given to nephritis or disease of the kidneys in various forms because the character of the disease was first demonstrated by Dr. Richard Bright, a celebrated English physician. Disease of the kidney ranks third or fourth among all causes of death. In one form or another it is also a contributing factor in the death of a very large number of persons classified as having died of other diseases. Chronic nephritis may be present for a long period of time without displaying any symptoms and possibly may only be discovered when a

train of symptoms suddenly develops or when some intercurrent disease demands the attention of a physician who may then discover the abnormal condition of the kidneys. This means that a fair percentage of people coming to physicians for treatment and especially those past forty years of age, are found to be affected with some degree of kidney disease.

The Nature and Varieties of Bright's Disease. In this volume we are not particularly concerned with the study of acute Bright's disease, which is common in children and in adults, as well as in persons of somewhat more advanced years. This class of disease has a sudden, acute onset with often very marked symptoms, such as fever, chills, pain in the back, nausea, vomiting, headaches, loss of appetite, general dropsy, scanty and bloody urine containing albumin and casts of various kinds. This is quite the usual train of symptoms, although certain acute cases of Bright's disease develop insidiously and no particular symptoms, except changes in the urine, may be noticeable at first, the characteristic symptoms not developing until some time later. There is also what is known as sub-acute nephritis, which is a condition intermediate in its symptoms and duration between the acute and the chronic form of kidney disease. This form is usually quite serious and has for one of its principal symptoms a general dropsical condition of the entire body.

It is the chronic form of Bright's disease which is usually found in middle and later life and which is the particular form in which we are in these pages especially interested, because it is a type which is most apt to de-

velop from long years of improper living. We are apt to disregard warning signals and push them aside, although they should be an intimation to us that all is not well. We are too apt not to take the trouble to interpret these danger signals or to find out anything about them. It is so easy to keep on doing things which are agreeable to us, even though we know that they must be in the end productive of harm. We like good tasting and rich foods, we are fond of heavy meats and rich gravies, we cannot, we think, get along without our three or four cups of coffee or tea at each meal. Some of us must have our cocktails or high-balls and our wines and cannot give up strong, black cigars, or an old, rich, succulent pipe, or twenty to thirty cigarettes a day. We must have our late parties and lose much needed rest, needed more than ever as we grow older.

We know that we are eating too much and exercising too little, we know that we are accumulating in our system every day toxins which will poison our blood and our tissues. We realize that other people who do what they should not do, who leave undone what they should do, have to "pay the fiddler" but we never stop to think that we are just the same as other people, that what happens to them is sure some day to happen to us if we follow in their footsteps. We seem to think that we are immune, that we can escape paying the penalty, that we are of a different stripe from the other fellow and that nothing can touch us in the way of disease. "Oh, I have done that all my life and it has never hurt me." Hasn't it! How do we know? We don't. We find out, however, often when it is too late. Then we are sorry.

We remember the various little things which have happened in the past to warn us that we were "going the pace" or at least, not living as we should. Those old headaches, those attacks of nausea, those spells of dizziness, double vision, that "all-gone" feeling! We never paid any attention to these warning signals. "Oh, that's nothing; it will pass away in a minute; I am just a little tired." Yes, we are sorry, but sorrow is a very unsatisfactory state. Being sorry does not bring back our health. Being sorry does not make us whole again. The old saying "better be safe than be sorry" is a true saying, and the way to be safe is to live as we should, not *after* disease has fastened itself upon us but *before*.

Pathological Changes in Chronic Bright's Disease. There are two principal types of chronic disease of the kidneys—the parenchymatous and the interstitial. In the first type the kidney becomes larger than normal, except in cases of long duration. The tubules of the kidneys are dilated and choked with broken down granular epithelium and fibrous casts. There is considerable increase of the connective tissue of the organ. Later on contraction of the kidney takes place. There are also numerous other changes in the structure of the kidney which interferes seriously with its normal function.

Symptoms of Parenchymatous Bright's Disease. In this form of chronic Bright's disease one of the most striking symptoms is edema or dropsical effusion in the connective tissue beneath the skin, or within one or more of the various cavities of the body. In some patients the edema is confined to the feet, ankles and legs. In other cases, it affects larger areas, causing infiltration of the

thighs and often the genitals. In the latter case it frequently interferes with the passing of urine. When the dropsy in the legs is severe it will sometimes stretch the skin so much as to cause it to burst at various points with the draining away of a serous fluid. This occasions much discomfort and often results in infection of the legs. Sometimes the edema will cause swelling and puffing of the face, especially the eyelids. The hands often puff up and feel stiff. In very marked cases the edema may affect the brain or the lungs and when this happens the result is apt to be extremely serious.

In addition to edema there is great debility and general weakness. Headache is very common as is also disturbance of the digestive system and loss of appetite. The blood pressure is usually higher than normal and in some cases it is extremely high, though it may vary, being higher at certain times than at others. In the earlier stages of this form of Bright's disease disturbances of the heart and of the blood vessels are not marked, though later on they may become quite prominent. Anemia, however, is generally present from the beginning of the disease, though it is not as a rule, very severe.

In many patients suffering from this type of Bright's disease the edema will gradually disappear and the type will change to the form in which edema is absent or at least not a prominent symptom. In chronic Bright's disease with dropsical swelling, the amount of urine passed is apt to be small and the specific gravity is either normal or somewhat higher than normal. The urine contains much more solid matter than normal. There is present a large amount of albumin and often hyaline and

other casts. Hyaline casts are formed in the convoluted tubules of the kidney and consist of small amounts of mucoid matter, taking the shape of these tubules and presenting under the microscope a glassy and crystalline appearance, hence the name hyaline. There are sometimes exudates or hemorrhages into the retina of the eye but these are less common than in some of the other forms of kidney trouble. In this particular type the outlook is not encouraging. So much damage has been done to the structure of the kidney that it is practically impossible to bring that organ back to anything like normal. Those patients in whom the edema disappears and who change to another type may do very well under proper care and treatment and often apparently entirely recover.

Interstitial Type of Kidney Disease. In this type of Bright's disease the kidneys are usually shrunken to a considerable extent and may become exceedingly small. This form of the disease has often been called "old man's kidney" because of its prevalence in those of middle and advanced years. There is a general degeneration of the kidney structure; the pyramids becoming more or less atrophied, the cortex thinned out, and there are changes in the blood vessels and the tubules of the organ. There is an increase in the amount of connective tissue in the substance of the kidney. The changes in the blood vessels consist largely in a thickening of their walls. "Old man's kidney" in which the pathological changes are as above described, is known technically as interstitial nephritis, or as contracted kidney, granular kidney, or arteriosclerotic kidney. In this form of chronic Bright's disease there is generally present a certain amount of enlargement or

hypertrophy of the left side of the heart and also of the muscular fibres of the arterioles throughout the body and in cases which go on for a long period of time a certain amount of fatty degeneration takes place in the hypertrophied tissues. Degeneration of the heart muscle and hardening of the smaller arteries is also present. In this form the onset is very slow and insidious and often quite marked changes occur in the kidney, the heart and the arteries before the disease is recognized, there being in the early stages no characteristic symptoms.

Symptoms of Interstitial Nephritis. In this type of disease there is frequent passage of urine which is pale in color and of a low specific gravity. The urine contains either a small amount of albumin or none at all. There are present in the majority of cases some hyaline and granular casts. The hyaline casts as stated above are formed within the small convoluted tubules of the kidney. Granular casts, composed of fine, granular matter are also formed in the tubules of the kidney. In this type of disease the dropsy which is so common in the other form does not appear, although sometimes there may be a little puffiness or swelling of the conjunctiva of the eye. Sometimes there are small hemorrhages into the whites of the eyes and there are also double vision and other ocular disturbances. There is generally very forcible heart action with high arterial tension. This is due entirely to hypertrophy of the left side of the heart.

The blood pressure is generally very high, ranging from 180 to 250 mm. There are frequent attacks of vertigo or dizziness, pulsations in the neck, headache from time to time and later on pains in the heart with palpitation, as

well as difficult breathing. Irregular heart action is very common as are double beats and indications of degeneration of the heart muscle. Anemia is a very common symptom. In addition there is general weakness, loss of weight, dry and scurfy skin and shortness of breath on slight exertion. In many cases there will be black specks before the eyes or flashes of light and dimness of vision. This form of chronic Bright's disease often lasts for several years.

In many patients suffering from this type of Bright's disease there is apt to occur what is known as uremic poisoning, this being an auto-intoxication due to retention in the blood of certain unknown but poisonous substances supposed to be caused by impairment of the function of the kidneys and by disturbed metabolism. When attacks of uremia occur and they cannot as a rule be anticipated there are symptoms of grave, systemic poisoning such as vomiting, headache, vertigo, stupor, drowsiness, itching of the skin, tremors, convulsions and sometimes attacks of apoplexy. All of these symptoms may not be present but enough of them develop to indicate uremic poisoning.

Complications in Chronic Interstitial Bright's Disease. Complications which may occur in persons suffering from the interstitial form of chronic Bright's disease are: Bronchitis, pneumonia, pleurisy, enlargement of the heart, inflammation of the membrane covering the heart (pericarditis), uremia and apoplexy. This is a type of chronic Bright's disease which is especially apt to develop after forty years of age.

Treatment of Chronic Bright's Disease. The treat-

ment of these two more common forms of Bright's disease, the parenchymatous and the interstitial varies somewhat in certain measures, although the general constitutional treatment is more or less similar. In the parenchymatous type where there is apt to be a considerable amount of dropsy present, rest is a primary necessity. Frequently rest in bed is to be advised, especially if the amount of dropsy is considerable. In many cases one has to remain quiet for weeks and sometimes for months. Protracted rest is often productive of very good results. Residence in a warm, dry climate is of the greatest importance. The wearing of underwear warm enough to prevent sudden chilling of the surface of the body is also to be advised. Light wool is probably the best material to wear next to the skin. In the treatment of all forms of chronic Bright's disease it is most important to build up the system, increase the vigor and the vitality as much as possible without putting too much of a strain upon the heart, the arteries and the kidneys themselves. When the treatment of chronic Bright's disease is undertaken, therefore, all possible measures are to be adopted to aid in the elimination of accumulated toxins from the system.

The majority of people even though they realize that there is something wrong with them still continue to abuse their bodies by being careless about diet, exercise and other important matters. Nature does her best to keep them straightened out but often goes down in defeat because she receives no help but only hindrance from the individual himself. In these cases Nature needs a little help and needs it promptly. Therefore, the first thing to think about is to ease the strain on the eliminative organs

and to get rid of accumulated poisons as soon as possible. This leaves the way clear for some real constructive measures which, being followed out, will tend to bring the eliminative organs as well as all of the other organs of the body back to a better general condition in which they will function more normally, and will also tend to bring the patient to a large degree, if not entirely, back to a more normal state of health.

These patients have usually been over-indulging in food either unsuited to them, in wrong combinations, or in too large a quantity. As a consequence there is an excess of nutrient material stored away in the system which is not being properly disposed of. One cannot cure one's self of poison by putting more poison into the system. When one overeats, all the nutrient material is not used up because before it gets a chance to be assimilated more is ingested so that the system is always surcharged with nutrient material. This excess acts as a poison in the system.

The thing to do then is to adopt measures which will tend to use up this excess nutrient material in the process of metabolism. This is accomplished by not putting more food into the stomach, thus allowing the excess already in the lymph spaces around the tissues of the body to be used up. In other words, this is accomplished by fasting and it is in this way that one can prevent the system from becoming more toxic.

Fasting in Chronic Bright's Disease. In most cases of chronic Bright's disease it is an excellent plan to begin the treatment by instituting a complete fast. The length of the fast will of course depend upon the general

vitality and weight of the patient and the condition of his arteries and other internal organs. As a rule, a fast of from seven to fourteen days at the very beginning of treatment is to be recommended. During a fast of this duration it is advisable to take a daily warm enema. Considerable water may also be drunk, but nothing else is to be put into the stomach. In some cases if the person fasting takes a dislike to plain water a small amount of lemon juice, orange juice or pineapple juice may be put in the water. Water often tastes badly to fasters because of the condition of their own mouth as the result of the fasting.

Fast-Breaking Regimens. At the end of the fasting period a fast-breaking diet is to be instituted. The length and character of this diet depends upon the length of the fast. After a fast of one or two weeks the following fast-breaking diet is generally satisfactory:

First Day: Three meals of juicy fruit, such as apples or peaches, or of citrus fruits, such as oranges or grapefruit, the meals to be taken at least five hours apart.

Second Day: One eight-ounce glass of whole sweet milk every hour for twelve hours, with the juice of one orange taken half an hour before the first glass of milk.

Third Day: One glass of milk every hour or half hour, according to the size of the individual, with an orange eaten thirty minutes after the first glass.

The Exclusive Milk Diet in Bright's Disease. Often an exclusive milk diet is of the greatest value in the

treatment of chronic Bright's disease. One does not as a rule, take as much milk as one would take to increase the weight or in the treatment of some other disease in which the milk diet is recommended. The reason for this is that too much fluid is not good as it is apt to put considerable strain upon the kidneys in their attempt to excrete an increased amount of urine and also because the arteries of the system are often affected with hardening and over-distension, which is apt to happen if too much fluid is taken, and this is most inadvisable. When the milk diet is taken, and it generally can be taken to advantage in cases of Bright's disease, it is best for the patient to remain in bed. This is especially the case in the parenchymatous type of the disease when there is considerable edema or swelling of the legs or other parts of the body. One begins by taking eight ounces of milk (one ordinary drinking glassful) every two hours during the first day, gradually decreasing the time between the drinking of the milk each day until a glassful is taken every hour.

Combination Diets and Salad Diets. There are cases in which a patient is unable to take to the bed in order to adopt the milk diet. In such cases a combination milk diet or a salad diet may often be taken as a substitute for the exclusive milk diet and may prove to be an excellent method of treatment. The combination milk diet is taken as follows:

Take a glassful of milk every half hour from early morning until about 1 P.M. Then take nothing until six or seven o'clock in the evening, when a moderate sized meal of soups and vegetables is taken. Those vegetables which

can be eaten raw may be so taken to advantage. A modification of this diet is to take milk until 1 P.M. and at six or seven P.M. take a meal of acid and sweet fruits, taking twice as much of one kind of acid fruit as of one kind of sweet fruit. One may take a little milk at this meal if desired. Salad diets contain organic salts and vitamins, both of which are absolute necessities in the system. Salad diets may consist of lettuce with tomatoes, scraped carrots, pot cheese, watercress, chopped onion, or juicy fruits. A simple but palatable dressing may be made from lemon juice and mineral oil. No salt or pepper is to be used in the dressing.

Occasionally a small amount of whole wheat bread or brown rice may be taken when on a combination milk diet or a salad diet, although it is not well to take much of this food, and if it causes any distress it must be discontinued at once.

General Diet. After discontinuing the milk diet, the combination diet or the salad diet, a diet of simple, plain, unrefined foods is to be taken. Proteins are to be largely avoided, especially flesh proteins of meat, fish and poultry. Egg yolk can often be allowed but only occasionally and in very limited quantity. A very satisfactory diet is composed of fresh fruits and fruit juices, fresh green vegetables either raw or cooked, vegetable and fruit salads, milk, cottage cheese, a very small amount of whole grain products in the form of breads, biscuits, or cereals, bearing in mind that any distress occasioned by such foods means their immediate discontinuance.

The system requires some protein food but the amount is much less than is ordinarily thought to be necessary.

Proteins can be easily supplied in other foods besides flesh foods in sufficient amount to meet the requirements of the body, but a lean protein diet is desirable in cases of chronic Bright's disease and these proteins are readily supplied in such articles as milk, cottage cheese, peas, beans, lentils and nuts.

As to the intake of fluids when other foods are taken, most authorities agree that the amount taken daily must be rather limited. In many cases no more than two quarts of fluid daily is desirable. This is of course much less than a normal person should drink as almost twice that amount for an active individual is necessary. When one is on a milk diet one gets of course a considerable amount of fluid and in this case one need drink but little water.

Other Measures of Value. In addition to diet, there are other measures which are of the utmost importance and which should be carried out faithfully and persistently. Residence in a warm, dry climate, has already been mentioned, as well as the wearing of light wool next to the skin. It is of the greatest importance to keep the surface of the body from becoming chilled because this puts a considerable strain upon the kidney function as chilliness and cold tend to over-stimulate the activity of the kidney. One will remember how frequently one has to void urine in cold weather or when the surface of the body becomes chilled.

Exposure in the sun is of great value, and the taking of daily air baths when the temperature is moderate and one can do so without becoming chilled, is very beneficial. The air bath can easily be taken in one's own home

by disrobing and walking about the room nude while the windows are open.

Daily warm baths are to be recommended. The patient takes a full bath in a tub and afterward a cool shower for a few minutes for its reaction upon the skin. This shower is to last only a few seconds and is to be immediately followed by a brisk friction rub.

Exercise. In the interstitial form of chronic Bright's disease where there is no evidence of dropsical effusion a certain amount of activity is of great value. Walking is a most excellent form of exercise as it stimulates the circulation of the blood and by warming up the body induces perspiration, thus taking some of the strain off of the kidneys. It also induces deep breathing and this is also an aid to the elimination of poisonous waste from the system as well as relieving the kidney of some of its work. Mild calisthenics are of great value but they must not be too strenuous nor be continued to the point of exhaustion. It is to be remembered that when one is suffering from chronic Bright's disease one is also generally suffering from some arterial as well as cardiac condition. In many cases special manual treatments are most desirable. These are applied by an attendant and are productive of excellent results. In the following paragraphs a few of them are described:

With the patient lying on the abdomen, a hot towel is placed along the spine. The operator places one hand on the legs and the other on the small of the back. The patient is instructed to clasp his hands behind his back and raise the head as far as possible by pushing the hands downward. The operator maintains firm pressure on the

legs but only sufficient pressure on the back to keep the towel in position.

Another treatment: With a hot towel along the spine, the patient lies on the abdomen, with the arms hanging down. The operator places his hands upon the patient's upper arms. The patient is then instructed to raise the arms to a horizontal position while the operator resists the movement.

Another valuable exercise: With the patient lying upon the abdomen, a hot towel is placed along the spine. The patient's head hangs downward over the edge of the bed or table. The operator places one hand on the small of the back and the other on the back of the head. The patient raises the head backward as far as possible, the operator resisting the movement.

Further movements: The patient lies prone with hands hanging over the side of the table or bed. The operator takes hold of the patient's arms and draws them forward and forces them backward several times, the patient resisting the movements.

If the patient is of fair strength he can make up several self-applied treatments himself. In this he needs no attendant. A few simple movements are as follows:

1. While seated in a chair flex the arms, with the elbows out. Twist the body far to the right and then far to the left, making an effort to carry the movement to the extreme limit. Continue until slightly fatigued, alternating from one side to the other.

2. Standing with the legs far apart and the hands clasped at the back of the neck, bend backward, then

rotate shoulders right and left without strain. Relax and repeat several times.

3. In a standing position, keeping the knees rigid, bend well forward, and then rotate shoulders right and left.

4. Lie on the back. Now swing the feet high in the air and back over the head, supporting the back with the hands. This exercise may have to be attempted several times before it can be performed quite effectively. It is one of the best spinal and abdominal exercises and helps to increase the height.

5. Catch hold of a heavy chair, or an ordinary chair braced under a bed. Now swing the body forward on the toes, pulling the head back as far as possible, supporting the body balance with the hands. This is an excellent exercise for the waist, chest and small of the back, and to help correct or prevent round or drooping shoulders.

6. Grasp the ankles with both hands, keeping the knees rigid. Now bend the arms and pull the body farther downward.

7. Resume sitting position and cross the left leg over the right knee. Place the heel of the right hand beneath the longitudinal arch in the center of the foot and grasp the toes with the left hand. Push upward against the arch with the right hand, while pressing downward on the toes with the left hand, so as to force the bones of the arch toward a higher position. Relax and repeat several times. Perform the same movement on the other foot by reversing the positions of the hands and legs.

8. Patient lies on the floor face down and grasps the right upper arm with the left hand, then raises the head as far as possible, trying to lift the right side up and back

to the left. The movement is repeated on the other side of the body by grasping the left arm with the right hand.

It is to be remembered that exercise in the form of walking, calisthenics and self-applied movements are not to be taken by a patient who is on a milk diet, nor by those who are being kept in bed. The special manual treatments, however, may be given by an attendant, often to the greatest advantage, even if the patient is in bed.

Bowel Elimination. Special attention is to be given to the eliminations from the bowels and to this end the use of laxative vegetables which means those containing cellulose and other bulk are of value. In addition, the use of mineral oil or agar agar is to be recommended and an occasional enema or a high colonic irrigation may be taken with most excellent results. Vegetables and other food substances which are valuable as favoring bowel elimination are as follows:

Artichoke	Currants	Parsnips
Asparagus	Dates	Plums
Beet tops	Escarole	Raspberries
Bran	Figs	Rhubarb
Carrots	Huckleberries	Spinach
Cauliflower	Kale	Squash
Chard	Lentils	String beans
Chicory	Mustard greens	Turnip tops
Collards	Onions	Turnips

Mental Attitude. Live in a cheerful place where there is plenty of sun, no dampness, and where the rooms can be thoroughly and properly ventilated. The sufferer from Bright's disease should surround himself with cheer-

ful friends and maintain a proper mental attitude, himself. He must be encouraged to feel that improvement is sure to follow as long as he lives correctly and observes necessary measures of treatment and that if he does so his days will be long in the land. Optimism and constructive thinking have a big influence for good upon persons suffering from chronic disease of all kinds and it must always be remembered, that no matter how seriously any of the vital organs may be affected, the correction of improper habits of living and the following out and observance of Nature's laws in the future will do wonders toward improving one's condition or even effecting a cure. Many a man who has been a sufferer from chronic disease and has been told by doctors that nothing further could be done for him and that the only thing for him to do was to wait as patiently as possible for the end, has turned to natural methods and been rehabilitated, renewed in body and in strength and if not entirely cured has at least been so helped as to make living for him once more a joy. No matter how serious a trouble one may have he must never give up. There is always hope, always a big chance that things will right themselves with his own help and that the shadows will be dissipated and the sun of health and vigor will again shine upon him.

Dropsy. Dropsy is an excessive accumulation of clear watery fluid in any of the tissues or cavities of the body. When it occurs beneath the skin of certain localities it is known as edema; when within the cavity of the abdomen it is known as ascites; when in the pleural cavity it receives the name of hydrothorax; if in the

pericardial sac it is termed hydro-pericardium. A general edema in which the entire body is subject to dropsical effusion is called anasarca.

Dropsy is not a specific disease but a symptom found in other diseases, such as certain types of heart or kidney lesions or in some form of liver disorder as well as in certain lung conditions. It arises from the exuding of some of the watery constituents of the blood through the walls of the blood vessels into the lymph spaces of the tissues or into the cavities of the body.

Dropsy produces a series of most uncomfortable symptoms. When it occurs in the pleura or pericardium it interferes both with respiration and heart action; when it develops in the tissues of the body it causes swelling, heaviness, a wooden or dead feeling, stiffness of the extremities or other parts and if it be marked, especially in the lower extremities, it often causes a rupture of the skin with the persistent oozing of the watery fluid through the broken integument. These latter cases are very troublesome because not only are they hard to heal but infection is very apt to occur at the points where the skin is broken.

Treatment of Dropsy. As dropsy is a symptom developing in the course of some specific disease, especially of the heart, the kidneys, the lungs or the liver, the treatment is naturally directed toward the particular disease of which the dropsical condition is a symptom. While the methods of treatment already suggested in cases of chronic heart and kidney disease also cover the cases in which some form of dropsical effusion may occur, there

are some cases in which this condition is so marked as to require special attention.

As a rule, dropsical swellings will reduce fairly satisfactorily if a fast is taken. If this is the case and if the strength and endurance of the patient is maintained or increased it is proof that the fast is of a great deal of value. However, in some cases there will be loss of weight, due to loss of flesh, yet the amount of dropsical fluid will remain the same. In such cases a fast is not to be continued for any lengthy period of time as there is apt to be a lowering of the vitality, which is undesirable. It must be remembered here that there are many persons who, while fasting, apparently lose a certain amount of vitality but the loss is only apparent. An actual test of their strength will show that they have more strength and more endurance than they had before they began to fast.

The milk diet has been tried very successfully upon persons suffering from dropsy. In taking the milk diet for the purpose of reducing the amount of dropsical effusion it is quite important that the patient remain in bed during the entire time he is on this diet. Wherever this is possible excellent results are generally obtained. There are cases of course where it is an impossibility for the patient to remain in bed long enough to make the exclusive milk diet of particular value and in such cases a limited diet may be undertaken as a substitute. The following limited diets may serve as a guide:

- (1) Six to twelve dates and one or two glasses of milk three times a day, the dates and milk to be taken

together, that is, take one date in the mouth and then sip a small quantity of milk and masticate the mixture together before swallowing.

- (2) Two or three ounces of raisins and one glass of milk two or three times a day.
- (3) Two ounces of any sweet fruit; one ounce of nut-meat and two glasses of milk three times a day.
- (4) Three meals daily of one ounce of flaked raw grains, two ounces of sweet fruit and one glass of milk.

Any of the above diets may be tried and the one which seems to be most satisfactory may be chosen and followed for a week or more if good results are being obtained. Either the milk diet or one of the above mentioned limited diets, preferably the milk diet if it can be taken, will give excellent results in the majority of cases. In addition, the regular treatment prescribed for the disease, of which dropsy is a symptom, is to be of course pursued, though it may have to be more or less modified if the milk diet is taken and if the patient remains in bed.

Let us correct a misbelief which is extremely common, namely, that water should not be drunk by a person suffering from dropsy. One may drink as much water as may be desired, although one should of course not drink too large a quantity. When, however, a person is on the milk diet, much water will not be needed.

Other Conditions in Which Dropsy Is Present. There are some cases of anemia in which edema is present. Improvement both in the quality and the quantity

of the blood will overcome dropsical effusion in such cases. Many pregnant women suffer from dropsical swellings of the legs and feet and sometimes other portions of the body. The growing uterus may cause serious interference with the circulation in the large veins of the trunk because of pressure upon them and in many cases pressure against the kidneys by the enlarged uterus may interfere with the function of these organs to a considerable extent and there is during the pregnant state in women who are not in the very best of health, a considerable demand upon the kidneys.

One or more of the above conditions may so interfere with the normal functioning of the kidneys as to produce a pathological condition of these organs, of which dropsy may be a symptom. In many cases of this kind uremic poisoning develops often with the occurrence of convulsions. This is known as eclampsia. In many cases of this kind the bringing on of premature labor and the extraction of the child from the uterus is frequently called for and will usually cause a subsidence of the condition and often save the life of the mother. In those cases where uremia is present and especially when convulsions occur, the child is very apt to die while still within the womb of the mother. Unfortunately also, in many cases, the mother's blood may become so poisoned that she herself will succumb in spite of all efforts to save her life.

CHAPTER SIX

Woman's Sex Life After 40

IT HAS been too generally assumed that woman's sex life is limited to the child-bearing period, the period between puberty and the menopause, and that, after the change of life, so-called sex life for her becomes a closed book. Instead, it is true that those who have been normal in their married life need not cease to be wives after they can no longer be mothers. Where the sex life is both regular and successful in the case of the wife it becomes established as a physiological habit, a well-conditioned nervous response, and in such cases it continues often for years after the menopause. In short, in any really successful marriage the menopause does not mean the end of sexual life. One, therefore, need not worry about the future in this connection.

The *menopause* or *change of life* (sometimes called the *climacteric*), is a condition in which menstruation ceases either suddenly or gradually, not to return after the change is completed. It is the local and systemic change resulting from cessation of the function of the ovaries and is accompanied by the gradual shrinking of the uterus.

The menopause generally occurs between forty-five and forty-eight years, though often earlier, even in the thirties, and there are many cases where it does not ap-

pear until well into the fifties. The menopause is considered to be the chief critical period in a woman's life, as at this particular time any of the organs not sound may be affected. Many of the organic diseases are prone to develop about this time.

Certain phenomena may or may not occur at this period. Among these are: *Flushes* ("hot flashes")—rushing of blood to the surface of the body, especially face and neck, with burning and tingling, lasting for a short time and receding, leaving the person in a more or less profuse perspiration.

Hemorrhages.—Slight irregular uterine bleedings from time to time. If these are profuse, frequent, or long continued it may mean the presence of some organic disorder of the uterus, so calls for careful investigation.

Faintness and *Palpitation*, of nervous origin, are common.

Hysteria sometimes occurs, as well as psychical disturbances, such as nervousness, insomnia, depression of spirits, delusions and a tendency to melancholia.

The Truth About the Menopause. All women pass through the menopause; but some pass through with no severe symptoms, and many have few and insignificant ones. The "change" is a natural process, due to cessation of the function of the ovaries, the body then being deprived of their internal secretion and being affected by the resulting alteration of the secretions of the other glands. The woman who lives healthfully will not have distressing symptoms at the time. When these develop it is necessary for her to reduce her toxemia, adopt a suitable vitality-building routine and avoid fear and worry.

In the woman who has passed forty whether or not "change of life" has occurred, there may exist various disabilities listed under the general classification of "female trouble." These may range from menstrual disorders to serious infections. All of these cannot be discussed here. But what we call "female weakness," while somewhat indefinite, may quite appropriately refer in part to the condition of prolapsed organs from which so many women suffer.

Prolapsus. In dealing with prolapsus there are two important essentials. One is the prevention of constipation. The other is strength-building exercise. It is rarely true that prolapsus is not always a matter of local weakness alone. It is largely the result of general weakness, the poor posture that expresses that weakness, and the accompanying visceroptosis or prolapsus of stomach, liver, intestines and other organs, all pressing down to crowd the female organs. It is not surprising that, under the circumstances, women have prolapsus or falling of the uterus. Nearly everyone has a certain amount of sagging of the digestive organs, sometimes very slight, but in some cases so extreme as to interfere with digestion and many other functions.

To be normal in this respect requires good, erect carriage of the body—no slouching—and an almost athletic state of vigor. Correct posture alone is not enough. One needs also strong abdominal muscles, creating a firm retaining wall, a muscular corset, as it were, to hold the large digestive organs and glands in place, but one needs more than that. One needs freedom from constipation. One hopes for that tissue tone and vigorous local health

that will follow on cleanliness, the use of cold water and the strengthening of the body as a whole. These things one must be sensible about. A woman should not think that she can go about as a female weakling, more or less of a physical wreck, and then expect that by some magic, a doctor can give her sexual health. It cannot be done.

A special type of exercise is particularly important in connection with prolapsus and other displacements of the uterus. Such exercises may be with the feet higher than the head. Place the small end of an ironing board on the edge of the bed, or on a chair, the other end resting on the floor. Make sure that the board will not slip. One of the large leaves from an extension dining table would do, preferably padded with a folded blanket. When properly placed it should give an incline of from twenty to thirty degrees. For forward displacement to recline face upward on this board, with the feet at the upper end, is corrective, for the falling or sagging of the womb is instantly checked and the pull of gravitation works in the opposite direction. For backward displacement take the same position facing downward. This inclined posture, incidentally, is most helpful to relieve the "bearing down" sensation in pregnancy. All those with prolapsus may use this position very frequently with or without exercise.

The simplest exercise consists of various leg movements, and these leg movements naturally are accomplished not merely by the muscles of the legs themselves, but largely by abdominal muscles, as will be found by placing the hands on the abdomen and feeling the muscles harden and contract as one lifts the legs. The legs

may be lifted one at a time in an alternate kicking action, then both together. They may be held together perpendicularly then pulled wide apart and then drawn together again. One can "scissors" or cross them sideways, the right leg first above and then below the left, and one can hold both legs up with bent knees and do an inverted bicycle ride. The muscles used will help to put all the sagging organs back where they belong and will help to build the strength to keep them there.

Another exercise that can be done on the inclined board, with the feet at the upper end, is to raise the head and shoulders slightly. If the feet are strapped down and one is athletic enough, one may do a complete "sit up" in this position; but this is strenuous and should certainly not be tried unless one is strong. But just lifting the head and shoulders will put a decided pull on the abdominal muscles, as will be quickly noted, strengthening them and bringing about a readjustment of the internal organs.

Such special exercises, persisted in morning and evening, will be invaluable, though they should be supplemented by outdoor activities that will take one into the sunshine. If possible it is well to do several miles of walking daily. Dancing, swimming, boating, tennis, gardening and other available exercises are also of great value.

CHAPTER SEVEN

Man's Sex Life After 40

AFTER forty, as well as before that age, it is every man's duty to make himself an example of superb health and to plan and hold fast to a program that will build up in him the constitutional vigor and general nervous stability upon which depends the normal nervous mechanism of the sex function.

In stating the problem in this manner, we have also outlined the remedy. In such cases there usually is a condition of more or less chronic poisoning; there often is a measure of malnutrition, and there nearly always is a general muscular deterioration and the victim usually fails to secure a proper amount of sunshine and outdoor life. These various conditions of general physical unfitness are usually found underlying the nervous debility that goes with failing potency. The victim often thinks the trouble to be due to mental strain and hard work, but there is little about hard work, even sustained mental work, that should produce such results in a perfectly healthy man.

This is all especially pertinent to the question of virility in husbands after forty, not only because it so closely concerns the necessary building up of general nervous integrity, but also because it has, in addition, a decided bearing upon the condition of psychic impotence. The

worried state of mind growing out of nervous commotion, the stress, tension and restlessness due to the inhibition of bodily action when the whole internal mechanism demands it, may very easily influence the psychological factors in failing potency. However, the quickest way to restore psychological normality is to bring back a normal and vigorous state of body.

To the victim of exhausted nerves, irritable and dejected as he is, and with an unconquerable tired feeling, the idea of exercise may seem absurd. He may dread exercise! In such a case one's program must be carefully planned, for one must make haste slowly. One must start with a little exercise and increase the amount gradually. It is the only way by which one can build strength. There is no strength to be obtained without effort. One may at first walk one block, then two blocks, then three blocks, then a quarter, a half, a full mile. One should walk slowly in the beginning, but later may increase both pace and distance. When one can walk from five to ten miles every day for a week, at a brisk pace, one will have forgotten that he had ever been tired. Every man and every woman should walk at least five miles every day, not only to promote personal and business efficiency, but to help to make him or her a better husband or wife.

For those who prize vitality and virility after forty (and who does not?), some more vigorous exercise than walking may be necessary for actual body building. Walking is a constitutional exercise, valuable for toning up the heart, the lungs, the digestion and the functions of elimination. Yet there is often not sufficient effort in just walking to build up the strength and the development which

goes to make one a perfect human. As soon as one feels sufficiently strong, therefore, one should add to his walking any other open-air sports that may be available to him, and of these rowing is perhaps the best of all for virility-building purposes, inasmuch as it concentrates activity and strength in the small of the back. Spinal strength and spinal stimulation in this region through such exercise will react directly on the nerve centers that have to do with sexual strength. Other sports and athletic pastimes, such as baseball, running, jumping, tennis, swimming, skating, fencing and canoeing, will help to build a more vigorous body than would often be possible through walking alone. Of course all more or less strenuous exercise should be dependent upon the absence of any physical condition which exercise may affect adversely.

One should also concentrate on some special or corrective exercises to be done morning and evening in the home, these exercises having to do especially with the strengthening of the muscles of the abdomen and back.

In this very condition a powerful local effect is secured by the use of the cold sitz bath. Sanitariums are provided with special tubs for taking these baths, but in the home any ordinary bathtub will serve as a fair substitute. Simply fill it to a depth of seven or eight inches with cold water and immerse the hips and abdomen for from three to five minutes. In a properly taken sitz bath the legs and feet are kept out of the water. If this cannot be easily done in an ordinary bathtub a wooden or metal washtub may be used. A brisk friction rub is to be taken immediately afterward. A hot cleansing bath followed by a

good cold shower has the effect of stimulating the nerve centers and sensibilities.

Exposing the nude body to the action of the air in the privacy of one's home, and the wearing of a minimum amount of clothing at all times, consistent with warmth and comfort, will greatly help in promoting nervous vigor. Excessive clothing is debilitating. The wise ones of today have quite discarded the old-fashioned underwear, and wear the same weight undergarments winter and summer, adding warm outer apparel when going outdoors.

After forty, as in earlier life, sunshine is a vital factor. There is more to it than a merely general benefit to health, for the vitamin-creating ultra-violet ray is found to have a special and very definite influence on sex potency. This indispensable factor should therefore not be neglected.

Sex responsiveness is subject to the rebuilding influence of sleep. The secret of sound, healthful sleep is largely found in exercise. If walking five miles will not make one sleep then walk six or eight miles. One should have an airy bed-room and not too much covering on the bed. A warm bath before going to bed may aid materially if one is nervous or excited. A little fruit or warm milk may be acceptable before retiring, but one should not eat heavily.

The amount of sex indulgence that tends toward good health varies with the constitution and temperament of the individual. The age factor naturally is of importance in this respect since what may be normal in young adult life may constitute excess in later life. In the forties and fifties, and especially beyond these periods, any greater

frequency than once a week or even twice a month, may be too much. Of course, individual differences still apply at these more mature ages, but it is here increasingly important to avoid excess. Yet it must be remembered that the natural law of the maintenance of a function as being dependent upon its continued exercise still holds good in these later years. On the other hand, it is also true that complete neglect or disuse of a function leads to its deterioration or loss. This is not said for the purpose of influencing any special course of conduct for those of mature years, but merely as stating a truth recognized generally by the medical profession. This suggests, therefore, the expedient of a temperate, moderate middle course with the passing of the years, as most conducive to health and personal efficiency.

Failing potency is often identified with departures from normal weight. Men who maintain the same weight through the twenties and thirties and forties seldom complain of waning sex powers. This disability occurs more often with the taking on of fat. But both fat and emaciation usually signify faulty nutrition, probably with mineral or vitamin deficiency.

Special attention may be called to vitamin "E"—the fertility vitamin. Animals are sterile in the absence of this food factor, but fertility is apparently largely restored when it is included in the diet. Its presence or absence in the diet seems to have a material influence upon the state of potency. It is well, however, to know that vitamin "E" is fat-soluble, and is especially identified with the fatty or oily factors in seeds and grains. That is one of the reasons why whole wheat flour may

be better than white flour. Vitamin "E" is also present in nuts, which are rich in fat. It is not suggested that the mysterious vitamin "E" will solve all one's troubles, but it is well worth keeping in mind.

Alcohol really is a narcotic depressant and not a sex stimulant. The supposed stimulation is more or less an illusion, due to the blunting of the drinker's sensibilities, much like his impression of increased speed when actually he is much slower in movements and reactions, as may be measured. Perhaps the supposed sex stimulating influence of alcohol is also an illusion, due to the blotting out of convention and cultural restraints and the temporary lapse into the state of licentiousness. Most of us, in matters of love, would not want our sensibilities blunted.

In men over forty, there is no question that there are many cases of psychological impotence, growing out of mixed factors of anxiety, nervousness and embarrassment. There is also a form of psychological impotence which may develop after years of married life. But most of the cases of failing virility after marriage despite previously demonstrated potency are the expression of physical deterioration, and usually this is entirely unnecessary. One can build manhood and can make himself the husband he should be after forty. Where there is a will there is a way.

CHAPTER EIGHT

Truths About the Prostate Gland

THERE is probably no portion of the human body about which more discouraging articles have been written and more terrifying advertisements printed than the prostate gland. The charlatans, quacks and some patent medicine manufacturers and also makers of various instruments for the so-called cure of disease of the prostate gland have filled the newspapers throughout the length and breadth of the land with advertisements which have a tendency to frighten half to death men who are troubled with some abnormal condition of this gland. Leaflets, booklets and throw-aways are sent out in the mail, stuffed in letter boxes, and handed out on the street corners by the millions, calling attention to the horrors of prostatic conditions. We are told how it wrecks one's life; destroys one's manhood; breaks up family ties; causes untold suffering and makes one long for death.

All this has instilled in the minds of thousands of men a fearful dread of what seems to them an inevitable accompaniment of advancing age, a condition from which there is no escape, and no possible chance of prevention. Naturally most of those who make these terrible prognostications have an axe to grind. The quacks are looking for patients whom they hope to frighten sufficiently in order to squeeze their hard-earned dollars from them.

The patent medicine manufacturers and the manufacturers of various apparatus naturally desire to sell their wares and are frequently not at all careful as to statements they make in their advertisements, and the more anxious the readers of these pamphlets and of these articles become the more business will the advertisers be apt to get.

All this does not mean that none of the methods advertised for the treatment of prostatic disorders is without value for this is not altogether true. Some of them have considerable merit and there are some methods and some apparatus which are advocated by respectable and reputable manufacturers without using "scare-heads" which have proved to be of a great deal of value in the treatment of prostatic conditions. But many less scrupulous advertisers play upon the credulity of the victims of this chronic condition from entirely selfish motives.

Anatomy of the Prostate Gland. In order to more thoroughly understand the facts attendant upon abnormal conditions of the prostate gland and especially those following enlargement of that gland, it is well to acquire a certain amount of knowledge of the anatomy of the prostate as well as its functions. The location of this gland and parts related to it are shown in the plate facing page 112.

The prostate gland, while having no direct connection with the process of reproduction, is considered as an accessory sexual organ. This is because it secretes not only a hormone or internal secretion which has a stimulating effect upon the sexual apparatus but also because it secretes another fluid, the prostatic secretion proper, which is discharged into the urethra and forms part of

the semen. The gland varies in size, but it is normally about as large as an ordinary horse chestnut, its weight being from one-half to three-quarters of an ounce. It surrounds and embraces that part of the urethra (the tube leading from the bladder through which the urine is voided) where it joins the bladder. It is situated immediately in front of the bladder and is intimately connected with both the bladder and the urethra, the latter passing through the substance of the prostate gland.

The prostate gland is generally described as being composed of three lobes: Two lateral lobes and one central lobe. As a matter of fact, however, the third or central lobe is practically just a median portion of gland tissue connecting the two lateral lobes. When either this median band or the lateral lobes become much enlarged it is considered as being abnormal. In structure the gland consists of fibrous muscular connective and glandular tissue, enclosed in a firm and very dense capsule composed of fibrous tissue. The ejaculatory ducts through which the semen is discharged into the urethra during orgasm enter the substance of the prostate gland and open into the prostatic portion of the urethra. The gland is plentifully supplied with arteries, veins and nerves. It attains its full normal growth about the time of maturity, namely, the twentieth or twenty-first year of life. The upper and the posterior portion of the prostate gland can be usually mapped out and felt by the finger introduced well into the rectum.

In view of the location of the prostate gland, one can readily understand how any inflammation causing swelling of its lobes or the connecting band or any degenera-

tive process causing the formation of new fibrous or other tissue in the gland which produces enlargement, will interfere with the proper voiding of urine because this enlargement compresses and narrows the calibre of the prostatic urethra and also projects inward pulling up the bladder tissues so that they form an obstruction to the passage of urine from the bladder into the urethra.

When the prostate becomes chronically enlarged and there is obstruction to the free passage of urine complete emptying of the bladder at any one time is interfered with and this allows some urine (called residual urine) to remain in the bladder. This residual urine becomes stale, undergoes fermentation and decomposition and sets up in time a chronic inflammation of the bladder which may also become severely infected. If not controlled the inflammation attacks the ureters or tubes conveying urine from the kidneys to the bladder and eventually the kidneys themselves become infected. In this way the entire system gradually becomes poisoned, often with disastrous results.

Abnormal prostatic conditions and especially hypertrophy or enlargement are extremely common and they are conditions which generally develop after middle life. Furthermore, unless checked or materially improved, they later on become very serious as has already been stated. But enlargement of the prostate gland is a condition which, in a large percentage of cases, can be avoided —a condition which may not develop at all, or at least in only a slight degree, in persons who have lived as they should, who have pursued a temperate, normal, moral life, free of excesses and especially of sexual excesses and

who have kept their bodies clean and free of poisons. It is of course recognized that the tendency to prostatic enlargement later in life exists in almost every man and it develops at least to a certain degree, in a very large percentage of elderly men, as it is more or less of a degenerative process.

There are, however, many things which have a tendency to produce prostatic disease in men who, in the natural course of events probably would not develop it, or at least not to any appreciable extent.

Some Causes of Prostatic Disease. Chronic inflammation as well as hypertrophy or enlargement of the prostate gland often develops as the result of acute inflammation of the gland in earlier life. Predisposing causes are tuberculosis and gonorrhreal infection. In men who have had disease of the genito-urinary tract, such as inflammation of the urethra or bladder, and who have had this disease treated by the use of strong and irritating injections, are apt to develop an acute inflammation of the prostate gland, which may become chronic and cause a great deal of trouble in later life. Over-indulgence in sexual relations as well as the habit of masturbation will also tend to produce inflammation of this gland. Stricture of the urethra (the urinary passage) and stone in the bladder may predispose to prostatic inflammation. Chronic prostatitis is a disease which usually follows acute attacks and is not limited to those of advanced years, though as a rule, it does not give a great deal of trouble until middle life when structural changes begin to take place in the gland, and the combination of struc-

tural changes and chronic inflammation cause the development of more or less serious trouble.

Hypertrophy or enlargement of the prostate gland, without the presence of chronic inflammation, is generally due to senile changes in the gland.

With acute inflammation of the prostate gland we will not deal in this book. We are interested entirely in the chronic inflammatory conditions of this gland and in hypertrophy or enlargement, appearing usually in middle life.

Chronic Prostatitis. The symptoms of chronic inflammation of the prostate gland are rather characteristic. There is usually a considerable amount of burning or scalding when voiding urine. This is frequently attributed by the patient to an inflammation of the bladder and is not always recognized, unless there is considerable swelling of the gland, causing interference with the free passage of urine. In younger men, who should naturally be virile and sexually normal under ordinary conditions, impotence often develops. This is very apt to cause a great deal of mental depression and the development of nervous symptoms which show themselves in the form of insomnia, irritability, and loss in weight. Such a condition has received the name of *sexual neurasthenia*.

In some cases of chronic prostatitis there is a certain amount of involuntary discharge of prostatic secretion. This is because in chronic inflammation there is often an over-production of prostatic fluid and the involuntary discharge will occur in the effort to get rid of the excess amount of this fluid. This extra secretion frequently causes the gland to increase even more in size and to be-

come more or less painful. The discharge of prostatic secretion is apt to take place during or after defecation or evacuation from the bowels. This is due to the straining which may take place at that time. It may also be discharged after urination as at the termination of that act there is a contraction of the sphincter muscles at the neck of the bladder, causing a certain amount of pressure upon the prostate gland.

Diagnosis of Chronic Prostatitis. The diagnosis of chronic inflammation of the prostate gland is usually made not only from the subjective symptoms of the patient but by an examination of the gland by the examiner's finger introduced into the rectum; by the examination under the microscope of some of the prostatic secretion, and by the occurrence of certain solid bodies in the urine which is passed after massage of the prostate gland by the finger.

In very mild cases the gland may feel normal to the examining finger but in well-defined cases it will be felt to be enlarged and more or less soft and tender. It may be irregular in shape instead of rounded. The secretion of the gland will contain many abnormal substances, such as pus cells and bacteria and often the gonococcus or gonorrhreal germs. It will also contain considerable solid matter and other abnormal substances.

Treatment of Chronic Prostatitis. In this condition the main object is to build up the system in general and to get rid of the local inflammation and infection. For the former purpose nothing is better than the institution of a complete fast for as long a period as possible, contingent upon the general condition and vitality of the

patient. Except in very old men, a long fast can usually be taken to advantage. The condition is one in which a long fast should give better results than a short fast. The shortest fast which should be taken is seven days, although fasts up to thirty days' duration are recommended if they can be taken without danger. The longer the fast the more rapidly will the condition be eradicated.

During the fast a daily warm enema is to be given and plenty of pure water is to be drunk. The drinking of two or three glasses of hot water, taken on arising in the morning, is of great value, and during the remainder of the day the water taken may be either hot or cold as desired. The fast is to be broken by a suitable fast-breaking diet of fruit juices or fruits and milk. The shorter fasts will require a fast-breaking diet of from two to three days' duration, while long fasts require a fast-breaking diet of four or five days. A milk diet, especially if large quantities of milk are taken, will often cause such an increase in the amount of urine secreted as to produce a great deal of distress in the bladder and prostate because of the necessity of frequent urination and the difficulty in starting the flow of urine due to the swollen prostate which interferes with the free passage of urine from the bladder. In men who are much below the normal in weight or in those having trouble in assimilating ordinary food a milk diet may often be taken to advantage, carefully watching the effect. When, however, an exclusive milk diet is taken it should be taken for only a few days at a time, being discontinued and resumed every few days. If the milk diet is not taken or

when it is finally discontinued, a limited diet such as the following may be instituted with good results:

Breakfast : Two ounces of raisins, one glass of milk.

Luncheon : Six dates, one glass of milk.

Supper : One ripe banana, one glass of milk.

Also the following: Six to twelve dates and one or two glasses of milk, three times a day, a date and some milk being taken at the same time and chewed in the mouth before swallowing. Another diet which may be taken with good results consists of two or three ounces of raisins and one glass of milk two or three times a day.

Either of the above diets may be taken for several weeks, if the weight and strength are maintained. If not, then a milk diet may be taken for a few days, then discontinued and the limited diet again started. This alternation may be pursued several times if desired and if satisfactory results are obtained. If the limited diet becomes at all monotonous vegetable and fruit salads may be substituted. No vinegar is to be used in the salad dressings but lemon juice may be substituted, and mineral oil used in place of olive oil. The vegetable salads may consist of either raw or cooked vegetables, or of both. A little cottage cheese may be combined with the salads or can be taken alone if desired. Moderate amounts of milk may be drunk when one is on a salad diet. Overeating is at all times to be avoided, only enough food being taken to maintain the weight and keep up the strength.

Strict attention is to be paid to the eliminations from the bowels. Constipation and straining at stool must be positively avoided. Full hot enemas may be taken when

necessary and mineral oil and agar agar in moderate quantities will serve to help overcome any tendency to constipation. Hot enemas have a soothing effect upon the prostate gland and can occasionally be taken to good advantage. Another excellent procedure is the taking of hot sitz baths every morning and evening. One may remain in the hot water for from fifteen or twenty minutes.

The hot sitz bath, however, invariably should be followed by a short cold sitz bath, lasting one or two minutes only. At night a hip pack may be applied upon retiring and allowed to remain until morning, or a wet towel may be left around the hips and properly covered with a protecting binder. Cold or tepid water may be used for the pack or wet towel. Plenty of pure, cool water should be drunk throughout the day, though if one is on a milk diet less water will be needed.

Local measures are often of great value in the treatment of chronic inflammation of the prostate gland. These consist in spinal manipulation, the application of diathermia, or the use of infra-red irradiation to the lower abdominal region. After the application of the infra-red rays cold sprays are useful, applied to the spot treated by the rays. Massage of the prostate gland in certain selected cases is of a great deal of value, but must not be used indiscriminately as frequently more damage than benefit will result except in appropriate cases. Cold douches, sprays or needle baths or the application of cold compresses to the inner surfaces of the thighs are frequently of considerable benefit. Of late years glandular products, given internally, have been used with con-

siderable success in many cases, the extracts administered being those of the prostate gland, the testes and the thyroid gland. Violent exercise is to be forbidden but moderate exercise, unless it is found to cause distress, may be indulged in to advantage. Rectal irrigations with hot or cold water are often very beneficial.

Recovery from chronic inflammation of the prostate gland is quite slow as a rule. The patient should be made to understand this but he should be encouraged by the knowledge that with perseverance and faithfulness in the taking of treatment he can be completely cured. As there is a large psychological element in these cases a proper mental attitude is most important. The assurance of not only the possibility but the probability of cure should go a long way toward securing to the patient a proper state of mind in relation to his condition.

Abscess of the Prostate Gland. Abscess of the prostate gland is a not uncommon condition. It may result from a primary infection or from an infection following acute or chronic inflammation of the gland, or from an extension of an infection from the urethra or the bladder. It is also always possible that damage done by a catheter or a sound not properly and carefully inserted or not sterile may cause an infection with the formation of abscess.

The symptoms of abscess of the prostate gland are similar to those of abscess in other localities, namely, swelling, heat, tenderness over the gland, and as pus develops, the occurrence of what is known as fluctuation, a feeling to be found in any swelling containing fluid.

The treatment of abscess of the prostate gland is usu-

ally surgical, although sometimes abscess will rupture spontaneously and drain either into the bladder, the urethra or the tissues around the gland. If it drains into the urethra or the bladder the pus will be passed out through the penis but if it ruptures into the surrounding tissues it will set up an inflammation in that organ with swelling, redness, heat and pain and the pus may burst through the skin of the tissues and be discharged externally in the space between the rectum and the scrotum, or it may burrow into other soft parts in that region and become very troublesome. In such cases an incision has to be made in order to obtain free drainage.

In elderly men the prostate gland may be the seat of cancer. The diagnosis is generally not made very easily in the disease and when discovered little can be done except that the prostate can be removed surgically.

Enlargement of the Prostate Gland. This is a condition which is most commonly found in middle-aged and older men. It is a fairly frequent condition and causes a great deal of inconvenience and pain as well as interfering seriously with the voiding of urine. Enlargement or hypertrophy of the prostate gland is due as a rule, to senile changes in its structure. There may be:

- (1) An increase in the stroma or substance of the gland of a fibrous character, known as a fibrosis.
- (2) New growths of glandular tissues known as adenoma.
- (3) Malignant growths, usually cancerous in character.

These structural changes may exist singly or in combination. The most common combination is that of increased glandular tissue or adenoma and of fibrous tis-

sue, the combination being known as adeno-fibroma. Adenoma or increase of glandular tissue usually begins in the so-called median or middle lobe or band of the prostate gland and later spreads to the lateral lobes. This growth may project up into the bladder or outwardly into the perineal tissues of the body. If the projection is upward it will compress the urethra at its entrance into the bladder and cause an obstruction to the flow of urine from it into the urethra as has been previously mentioned. The amount of obstruction naturally depends upon the amount of enlargement of the gland.

Typical hypertrophy or enlargement of the prostate gland is really new growth which is often, but not always, inflammatory in its nature. A simple, non-malignant enlargement of the prostate gland may eventually develop into a malignancy. It is therefore, of the greatest importance to begin the treatment of enlargements as soon as they become recognized so as to prevent this unfortunate occurrence if possible.

The cause of senile hypertrophy of the prostate gland has not been satisfactorily demonstrated. Many believe it is due to an irritation as from masturbation or sexual excesses; others claim it to be due to the existence at some time of such diseases as gonorrhea, syphilis, stricture of the urethra, or stone in the bladder. At the same time there are many men who suffer from enlarged prostate glands who have practiced moderation in their sexual lives, who have never had any venereal disease, or any stone in the bladder. The condition seems to be fairly common in persons of extremely nervous temperament and in those who worry a good deal. One authority

has stated that enlargement is due to an increase of connective tissue in the gland while others believe that the original infection producing inflammation and subsequent enlargement is almost always gonorrhreal. Many authorities, however, seem to coincide in the belief that no matter what the structural changes are the condition is essentially a chronic inflammation and this belief is held by some of the best known genito-urinary specialists in this and other countries. There are some, however, who feel that the condition is due to an increase of fibrous tissue rather than connective tissue, while others again lean to the belief that the increased tissue is glandular in character. It is possible that some cases are of one character and other cases are of another character and that still other cases show an increase of more than one of these several kinds of tissues. It appears, however, to be a fact that when the enlargement is found mostly in the median or so-called middle lobe, the increase is largely glandular in character.

Enlargement of the prostate gland may affect either one or both of the lateral lobes or the median or middle lobe, or both lateral and median lobes. In cases of enlargement of this gland there are certain changes which occur in that part of the urethra passing through the gland. These changes consist in a thickening of the mucous membrane of the urethra, a change in the normal curve of that passageway, a narrowing of its canal and a loss of its elasticity. Owing to the retention of a considerable amount of residual urine, changes in the structure of the bladder walls will often occur, these changes consisting of a thickening of the muscular fibres with a con-

sequent diminution in the capacity of the bladder. Ulceration of the bladder tissues lying in contact with the enlarged prostate gland often occurs.

Symptoms of Enlargement of the Prostate Gland. The symptoms of chronic enlargement of the prostate gland depend naturally upon the amount of enlargement, the length of time it has existed, the general condition of the afflicted person, the condition of the mucous membrane of the bladder, the amount of residual urine as well as the amount of obstruction. Unless the enlargement is well marked the symptoms are apt to be comparatively slight, although there are cases in which they develop in the early stages and cause a great deal of inconvenience, if not actual suffering. Practically the first symptom which is complained of is inability to urinate freely and fully. In these cases there is a considerable delay before the stream of urine appears. There is also an increased frequency of urination which is apt to be very troublesome during the night. The inclination to void urine may occur, however, from every two hours to every half hour or less and in some cases every few minutes. As the enlargement increases the frequency of urine during the day as well as during the night also increases. Thus these sufferers have difficulty in attending to their business and they are unable to get proper and sufficient rest at night. After a time, there is a noticeable decrease in the force of the urine stream. Instead of being ejected with a certain amount of power the urine just seems to run out without any force behind it. As a consequence, the stream drops straight down from the end of the penis or even takes more or less of a backward curve. At the

end of the act of urination there is considerable dribbling of urine. As stated before, the retention of a quantity of urine in the bladder may lead to fermentation, decomposition and putrefaction with the result that there frequently develops an inflammation of the mucous lining of the bladder and of the prostatic portion of the urethra. This has a tendency to increase the desire to urinate as well as to cause irritation and pain in these parts. The urine undergoes an alkaline fermentation, becomes very offensive, or has a strong odor of ammonia and contains a large amount of mucus and pus and sometimes blood.

Infection beginning in the bladder may spread to the ureters and later the kidneys, in which case such conditions as pyelitis or purulent inflammation of the reservoir or pelvis of the kidney may develop, or both the pelvis and the tissues of the kidney may become affected, with a purulent condition. Other symptoms which are common in these cases are pain in the region of the perineum, the pain being usually more or less dull and nagging in character, though sometimes becoming quite severe, especially after bowel evacuations, after much walking, or when the bladder is full. There are some cases in which no particular discomfort is felt, although there is usually some pain felt in the perineum. There is also considerable heat in the perineum as well as a bearing down feeling as though there was a lump or a ball pressing down in that region.

The appetite is apt to be very variable and is sometimes lost altogether. Flatulence and intestinal gas are common symptoms. Constipation is usually present and hemorrhoids are apt to develop if constipation is marked,

and especially if there is much straining at stool. Men suffering from prostatic enlargement are apt to become despondent and depressed. Their nervous systems become greatly deranged, some of them actually suffering from nervous collapse.

Complications in Chronic Prostate Enlargement. In many cases of chronic enlargement of the prostate gland there may occur times when the person will be unable to pass any urine at all. This may be due to sudden additional swelling due to irritation or inflammation, or it may be due to a spasmotic contraction of the urethra or to other causes. The inability to pass urine of course results in complete retention of whatever urine is accumulating in the bladder and as the bladder begins to be over-distended great distress and often very intense pain is felt. The cause of inability to void urine is also frequently due to the fact that the middle lobe of the prostate, if enlarged, may push up and act as a sort of valve, closing over the entrance to the urethra. In other cases it is due to the swollen lateral and middle lobes compressing the urethra and closing off the caliber of that tube. In such cases special methods of treatment are required as will be described later. Exciting causes which sometimes produce retention of urine and inability to void are exposure to cold, dampness and wet, over-indulgence in sexual intercourse, straining at stool in constipated cases, the accumulation of fecal matter in the rectum and the drinking of alcoholic beverages. In some cases a stone in the bladder may become impacted near the outlet and may block the opening into the urethra. Many persons troubled with enlargement of the prostate gland are af-

fected with dribbling of urine. This is usually due to the over-flow of retained urine. Emptying the bladder stops this dribbling for the time being.

Hemorrhoids which complicate prostate gland enlargement may come from straining at stool because of constipation. The enlarged prostate gland forms more or less of a projection into the rectum, interfering with normal bowel evacuations and causing retention of fecal matter in the lower bowel. Straining attempts to dislodge this fecal matter as well as the direct pressure of the fecal matter itself will tend to the development of hemorrhoids. Straining at stool will also, in the case of men who have weak abdominal walls, tend to the production of hernia or rupture. Prolapse of the rectum is also a not uncommon complication of prostatic enlargement and may often result from straining at stool. Inflammation of the testicles is a complication which is occasionally met with and is due to the spread of the infection to these glands.

There is a condition known as catheter fever, which quite frequently attacks those persons who have had to resort to the use of the catheter in order to relieve the over-distended bladder. In cases of this kind there are chills, fever and general aching of the body. The condition is, however, only of short duration in the majority of cases.

Spasm of the neck of the bladder is another complication which causes a considerable amount of distress. It produces a great deal of straining which is continuous. A very small quantity, sometimes only a few drops of urine, will be voided at a time. This causes a great deal of burning and scalding. As the condition continues the

result becomes serious. The patient is unable to sleep, he suffers from extreme irritability, gastric disturbances, gas, loss of appetite and headache. If not relieved and if large amounts of decomposed urine remain in the bladder, the kidneys will often become involved and uremic poisoning may develop. There is a strong odor of urine to the breath, and sometimes the perspiration. The tongue is dry and coated and unless the conditions are removed at once, usually by surgical measures, the result may be fatal.

Diagnosis of Chronic Hypertrophy of the Prostate Gland. Diagnosis of enlargement of the prostate gland is fairly easy. When a patient complains of difficulty in passing urine, a loss of force of the stream, a diminution in the size of the stream, and of frequent urination, especially at night, and more especially after he is over fifty years of age, there should always be a strong suspicion of the presence of prostatic enlargement. This is easily confirmed by rectal examination. Another important method of diagnosis is to have a person pass his urine or as much as he is able and then to have a catheter introduced into the bladder and the residual urine drawn. The amount of residual urine will indicate to a certain extent the amount of obstruction present. Medical men make certain other tests, such as measuring the length of the urethra, which is generally found to be somewhat elongated, or by an examination of the interior of the bladder by means of an instrument called the cystoscope. A urinalysis will usually disclose the presence of mucus, pus, blood, and other abnormal constituents which are apt to be found in case of enlarged prostate gland.

Treatment of Enlargement of the Prostate Gland. The treatment of hypertrophy of the prostate gland is sometimes very effective within a reasonable length of time, but it frequently must be persevered in for a long time before even appreciable results are obtained. The treatment is both local and constitutional, the local treatment consisting largely in giving relief to the sufferer by endeavoring to counteract any tendency to the development of inflammatory conditions of the bladder or kidneys, to remove residual urine from the bladder, to keep the bladder in as clean a condition as possible, and also to keep the prostatic urethra as open as possible so as to favor the passage of urine from the bladder. Naturally, there are cases of enlargement of the prostate gland which are in such a serious condition when attention is first called to them that these palliative measures are of no particular avail and constitutional treatment will not accomplish looked-for results. In cases of this kind operation has naturally to be seriously considered.

A certain percentage of men who suffer from enlargement of the prostate gland have to resort to the use of a catheter, otherwise they can never empty the bladder, thus allowing the accumulation of residual urine and the possibility of infection. When urine cannot be satisfactorily voided and when the catheter has to be used, it should be used as infrequently as possible and must be inserted with the greatest care. In some cases an ordinary soft rubber catheter will answer, but in the majority of cases a special catheter which is somewhat stiffer than the ordinary soft rubber catheter has to be used.

A catheter with a special tip is made for use in cases

of enlarged prostate gland. The special curve at the end of the catheter enables it to pass over the obstruction and enter the bladder more readily. Unless great gentleness and care is exercised in passing the catheter damage may result, for if too much force is used the urethra may be ruptured with the creation of a false passage and this constitutes a very serious complication. Roughness in the use of the catheter is also apt to irritate the urethra and the gland itself, causing congestion, inflammation and further swelling. If the mucous membrane of the urethra is injured, bleeding will often follow.

In using the catheter all antiseptic precautions must be observed. The catheter must be properly sterilized by boiling and must be kept in a sterile towel or be wrapped in sterile gauze until used. Before inserting the catheter into the urethra the foreskin is to be fully retracted, the penis and especially the head or glens of this organ is to be washed with an antiseptic soap in hot water, dried with sterile gauze and then anointed with some sterile jelly. A sterile lubricant is also to be applied to the catheter before being used. The person who is using the catheter must wash and thoroughly sterilize his hands before handling the instrument and attempting to introduce it into the urethra.

The operation of catheterization can be performed while the patient is lying on his back on a bed or a couch, or if he is catheterizing himself he may stand with his feet apart and lean slightly forward. The catheter is introduced very slowly and cautiously as far as it will go, without interference. It must then be manipulated until

the tip of the catheter meets with the obstruction, when it has to be slightly withdrawn and again pushed forward gently, and this withdrawing and pushing forward may be continued, feeling the way very carefully and being sure that the curved end of the catheter is always pointing upward. When the tip of the catheter over-rides the obstruction and passes into the bladder it can be distinctly felt by the patient and the person passing the catheter will also feel a sudden release of the tip of the catheter as it passes over the obstruction.

Some sufferers from prostatic enlargement who have to use catheters for relief become very expert and get along very well but the living of a catheter life is most unsatisfactory and promises nothing but temporary relief. There is always the danger of doing harm by injuring the parts, or by infecting them. The use of the catheter is therefore to be recommended only as a temporary expedient. Dr. Charles S. Hirsch states in his book "Genito-Urinary Diseases and Syphilis" that the mortality in catheter cases sooner or later is one hundred per cent, that is, if nothing else is attempted but use of a catheter the sufferer is bound in time to succumb to infection or exhaustion. As a rule, the use of the catheter once in twenty-four hours will be necessary to keep the person comfortable, unless he drinks so much fluid that a large amount of urine is secreted by the kidneys, or unless the bladder has become so thickened as to greatly decrease its capacity. In some cases when the sufferer is merely troubled at night with a desire to urinate, a catheter may be inserted into the bladder on retiring and left in all night, the free end being attached to a rubber tube which empties into the

receptacle at the bedside. This, however, is not good practice and should be avoided if possible. In many cases irrigation of the bladder through a catheter after the urine has been passed, gives great relief. Solutions of boric acid may be used for this purpose to advantage.

As to the constitutional treatment pursued in cases of enlarged prostate gland, the chief object is to build up the system as much as possible. There are also certain important rules which should be strictly observed. Among them are the avoidance of all sexual excitement and lascivious thoughts. This is important as sexual excitement produces congestion of the parts and this naturally has a tendency to increase any inflammatory condition which may exist and make relief more difficult to obtain. Sexual intercourse also is best generally avoided. The taking of hot sitz baths twice daily is of considerable value. One may remain in the hot bath for fifteen or twenty minutes, adding hot water from time to time. Immediately after the hot sitz bath a short cold sitz bath should be taken. Many men are able to void urine with less straining and discomfort immediately after taking a hot sitz bath, and such a bath is of great value also for the relief of pain.

In cases of prostatic enlargement particular attention must be paid to the diet. All rich foods, highly seasoned foods, spices and condiments are to be avoided. It is well also to be particularly abstemious in the use of meats, fish and eggs. While the drinking of extremely large quantities of water is not to be recommended, it may be quite freely taken in most cases. Tea, coffee and all alcoholic beverages are, however, to be strictly avoided. Con-

stipation must not be allowed to occur and this can be usually brought about by the eating of foods containing cellulose which furnish bulk in the intestines. Among such foods are string beans, lentils, onions, beet tops, chickory, turnip tops, artichokes, kale, chard, spinach, carrots, squash, cauliflower, huckleberries, figs, dates, currants and plums.

Whole grain products and bran contain considerable roughage and will aid greatly in overcoming constipation, but many people cannot take very much roughage without producing a certain amount of intestinal irritation. Agar agar can also be taken when constipation is present. Mineral oil, psyllium seed and even flaxseed may often be taken to advantage, the dose being regulated by its effect. Mineral oil acts simply as a lubricant and is not absorbed, but in lubricating the intestines it makes it easier for fecal matter to pass through the colon and as it becomes mixed with the fecal matter it softens it so that it is more easily discharged from the body. Psyllium seed and flaxseed, like agar agar, provide bulk in the intestine.

Abdominal massage, applied once or twice daily, using a clockwise motion, is of the greatest value when constipation exists. Exercise, especially walking, is an excellent measure when it can be taken but in many cases of prostatic enlargement there is so much distress and discomfort and even pain that much exercise cannot be taken. Hot rectal irrigations are often of great value when constipation exists and in addition, hot water has a very soothing effect upon the prostate gland. When such irrigations are given a return flow tube can be used to ad-

vantage and a considerable amount of water allowed to flow in and out of the colon. Massage of the prostate gland is of value in some cases of prostatic enlargement but not in all cases. Where there is much congestion of the gland or where much pus is found in the urine, massage is not advisable.

Very often the use of diathermia or infra-red irradiation is followed by considerable relief of pain and discomfort. In many cases also the use of an instrument inserted into the rectum and through which a constant stream of hot water is made to flow, will give much relief. Other apparatus are on the market which are inserted into the rectum and heated by an electrical current. These are also of considerable service in selected cases.

Sufferers from prostatic enlargement must lead very quiet, even and methodical lives. They must pass urine immediately when there is the slightest desire to do so, but it is well if possible, to void urine at least once every two or three hours. If one waits too long after the inclination to void is felt, it may cause the occurrence of spasm of the bladder, with the resulting inability to pass any urine at all, this often requiring the use of a catheter in order to give relief.

In many cases where the general physical condition of the person will allow, a fast may be taken to advantage. Even though the prostate gland is so hard that there is little chance of reducing its size, a fast may be of value for its general good effect upon the system. It aids in eliminating any accumulated toxins from the body and in these cases there is usually a considerable amount of

systemic toxemia existing. This elimination may be of considerable service in cases where there is irritation or inflammation in the bladder or in the kidneys. The fast may continue for from one week to two or three weeks if conditions are favorable, and the patient is of normal weight or is overweight, and has a sufficient amount of vitality. During a fast a daily enema is taken and a fair amount of pure cool water is drunk.

Some persons can be up and about as usual during a fast, while others do better by keeping quiet, although they may not have to remain in bed. A certain amount of activity is, however, usually advisable, though it must be very moderate in amount. The fast is broken by two or three days on a fruit juice diet, or a vegetable broth diet, or on a fruit diet, taking in addition, one glass of milk three times daily.

In addition to the above constitutional measures general vitality building measures are of the greatest value. The taking of sun baths for instance, as well as daily air baths, is to be highly recommended, as is also the taking of warm water baths followed by cool sponges or showers and body massage. One should get as much rest and relaxation as possible. If one is unable to sleep a sufficient number of hours or obtain the required amount of rest, one should lie down and completely relax for more or less short periods throughout the day.

Indications for Operation. While much can be done for the relief of chronic inflammation of the prostate gland by natural methods and without resorting to surgery, there are cases which, through neglect or improper or insufficient treatment, or in which the diagnosis has

not been made until irreparable damage has been done, have progressed beyond the stage where natural methods will produce marked effects. In such cases the question of operation is often to be considered. In spite of all active treatment some of these cases go on from bad to worse and unless some radical measures are undertaken the case is quite apt to terminate fatally from exhaustion and infection. It is in such cases that operation has frequently to be performed as being the only measure which may offer a hope of relief. Many thousands of sufferers from chronic prostatic inflammation and chronic enlargement of that gland, are able to live out their life expectancy in comfort by taking proper care of themselves and following out such measures as are set forth in this chapter and may thus avoid the necessity of operation. But as stated above, there are cases where operation is called for and sometimes called for in a hurry. Palliative measures such as the use of the catheter have already been discussed. The author feels, however, that although it is somewhat outside the purpose of this book to discuss operative measures it may be proper to mention the subject as so many operations are at the present time being performed for the radical relief of prostatic enlargement.

Operation on this gland is not now considered as giving such a small chance of recovery as formerly. It is at present most successfully performed in cases where there is any chance at all for the patient. There is, however, always a certain amount of risk taken by a patient undergoing any surgical procedure. Removing a corn has resulted fatally; operations on tonsils have taken their

told many, many times, and minor operations of various kinds have been followed by fatal results to say nothing of those following major operations. Some of these bad results may have been due to the ignorance or carelessness of the operator, or from lack of proper after-care but frequently they have been beyond control and occasioned by some accident or by the general condition of the patient at the time of operation.

It must be understood that the author is not claiming that operations are not necessary in many cases, because they undoubtedly are, but there are nevertheless many operations performed unnecessarily upon patients who might have received relief or have even been cured by following natural methods.

Many cases of prostatic troubles have been and are being relieved without operation and life made not only bearable but once more fairly enjoyable.

The Hormone of the Prostate Gland. The prostate gland, while secreting a fluid known as prostatic secretion, which goes to form a part of the seminal fluid, also secretes a hormone or internal secretion which is supposed to have a marked influence upon the sexual apparatus. When enlargement of the prostate gland develops it is claimed that genital excitement is often markedly increased. Lessened activity in the production of this hormone is said to cause lessened potency in the individual. Removal of the prostate gland in its entirety should therefore result in still less potency, or in its entire disappearance. Removal of the prostate gland would naturally then be expected to have a marked effect upon sexual desire as well as upon virility.

When the prostate is removed and its hormone can no longer exert its influence, the necessity for more activity is placed upon some of the other endocrine glands, the secretions of which must help to make up for the loss of prostatic secretion. But though hypertrophy or enlargement of the prostate gland may be productive of increased excitement of the sex organs, many men affected with this enlargement are more or less impotent. Erection is often difficult or impossible, but when sexual intercourse is possible, orgasm is often accompanied by severe pain which may last sometimes for a day or two, or even longer. In many cases, however, removal of the gland does not prevent erection nor the performance of the sexual act although in a large percentage of cases it causes mechanical sterility because of the fact that the ejaculatory ducts through which the semen is ejected and which pass through the prostate gland, after operation for its removal, often become twisted, occluded, or bent backward in such a way that during orgasm the semen is ejaculated into the bladder, unless the ducts are completely occluded, in which case no semen will be discharged, either externally or internally.

CHAPTER NINE

Guarding Against Physical Collapse After Forty

A MACHINE of any sort is subject to wear and tear. Still, when a machine is properly designed and properly constructed, it is not likely to collapse suddenly unless there has been abrupt or prolonged disregard of its operating requirements. The human body is so equipped and so constructed that it will endure wear and tear decade after decade, before and after forty. In its normal condition, it is proof against sudden collapse even in the later years of life. Yet we cannot expect such endurance when the body has been subject to neglect as a result of ignorance or defiance of the laws of health.

To deal with the matter fairly, your body is intricate in its operations to greater degree than any ordinary machine. Indeed it is far more than a machine, for it is constantly engaged in transforming air, water and food into human flesh and blood and energy, serving in this respect as a chemical laboratory. Distributing this energy to the various muscles and structures of the body, including the brain, by which all its forces are controlled, your body is also an intricately constructed power plant. To eliminate harmful wastes, your body is further served by complex equipment.

These services are performed by the organs of diges-

tion, of circulation and of excretion—by the heart, the lungs, the kidneys and other organs of the body. The results of wear and tear upon these organs, the possibilities of repairing such wear and tear, and above all, the means by which wear and tear in this direction may be avoided, have been stressed in these pages.

Sudden collapse and breakdown of the body, whether seemingly of physical or nervous form are the results of neglect of the requirements of the body just as the gradual breakdown that may accompany a chronic disease is the result of such neglect. The penalty is not to be escaped, whether it is peremptory or protracted.

Intelligent usage of the body will result in protection against sudden nervous and physical collapse and breakdown just as it guards against chronic forms of disease.

Nervous Prostration. A breakdown of the nervous system actually is a form of physical breakdown. True enough, the symptoms may be nervous in nature. The causes also may lie apparently in nervous disturbance. Yet the failure of the physical organism to support the nervous system when under stress is the chief cause. There is no attempt here to gainsay the fact that mental problems play an important part in the health of the individual. Still, one who is over forty can overcome nervous prostration of such origin as efficiently as can a younger man or woman.

Fear of sudden breakdown after forty on the part of the man or woman in sound health is quite unfounded. At any time of life when there is physical and mental collapse apparently without warning, organic weakness of some sort exists. Physical conditions that require mend-

ing are usually responsible. An understanding of such causes of breakdown is provided in the description of causes of chronic diseases that have appeared in these pages.

Sudden Breakdown After Forty. Let us consider types of sudden physical collapse that are unhappily common. When a person suffers sudden collapse involving unconsciousness it is of the greatest importance to know whether the condition is caused by an apoplectic "stroke" or by some other abnormal condition. There are several such conditions namely, alcoholism, opium poisoning, uremic poisoning, diabetic coma, fainting, and hysteria. Fortunately there are several symptoms which serve to distinguish these conditions one from the other and which are quite easily recognized by the ordinarily intelligent doctor. To the layman, however, there are one or two characteristic symptoms which it may be well to detail as a knowledge of them may be the means of enabling him to differentiate between the various conditions producing unconsciousness and thus give opportunity to apply proper emergency treatment and possibly be the means of saving a life at some time.

In ordinary fainting or what is called syncope the pulse is feeble, the face pale, the respiration quiet and the duration of the attack very short.

In alcoholic insensibility the person can generally be at least temporarily aroused by shaking. There is a drawing in and a puffing out of the cheeks during respiration; the pulse is rapid instead of slow; the pupils of the eyes respond to light; the head and eyes are not turned to one side; the inhalation of smelling salts or pressure upon

the nerve at the edge of the bony orbit above the eye where a little notch may be felt will also generally arouse the person though he will again become insensible as soon as he is let alone.

In opium poisoning the coma develops gradually and not suddenly; the pulse is slow but quiet; the pupils of both eyes are even but very markedly contracted, sometimes being as small as a pin point; the breathing is very slow but regular and not of the Cheyne-Stokes variety and it is not noisy as in cerebral hemorrhage cases. Sometimes these persons can be temporarily aroused only to become unconscious again but in other cases it is impossible to rouse them although they will often moan or grunt when shaken or slapped.

In uremic poisoning the coma very closely resembles that of apoplexy but if it is known that the person is suffering from Bright's disease it will usually explain the coma. In such cases the urine may be drawn by means of a soft rubber catheter and subjected to a chemical and if necessary a microscopic examination in order to determine the presence of albumin and casts. In uremic poisoning the coma is very apt to be preceded by general convulsions and there is an early high body temperature. The pulse is weak and often irregular and the breathing is rapid.

Diabetic coma can as a rule be determined by a knowledge of the presence of diabetes and an analysis of the urine to determine the possible presence of acetone and diacetic acid as well as sugar. The urine can be obtained by catheterization when coma is present. In diabetic coma the blood pressure will be found to be very low.

Hysteria finds the reflexes are present and responding to stimulation; although there may be temporary loss of sensation on one side of the body as well sometimes as temporary loss of hearing and vision. As a rule pressure against the supra-orbital notch mentioned above as in the case of alcoholic insensibility, will often produce a response and a return to consciousness. But many cases of hysteria are very puzzling and sometimes rather difficult to diagnose.

Cerebral hemorrhage, popularly known as a "stroke," may be correctly described as apoplexy. It is caused by the sudden rupture of one of the small arteries in the brain and the escape of blood into the surrounding brain tissue. This results not only in causing pressure upon the brain by the blood or the clot formed by the blood but also in many cases in more or less destruction of brain tissue.

Apoplexy usually does not occur until after forty years of age. It is considered as a disease of middle and late life though it is possible for it to occur under certain circumstances such for instance as a head injury or from syphilis, at almost any age. The condition is much more common in men than in women. For some apparently unknown reason too, it seems to occur more frequently in the spring and fall of the year than at any other season.

It is almost always the result of disease of the arteries, particularly arteriosclerosis or hardening. Contributing causes may be advancing age, chronic poisoning as from alcohol, lead and tobacco, the presence of diabetes, gout, Bright's disease or syphilis. When any such conditions

exist apoplexy may be precipitated by anger, excitement, overexertion, straining, overeating or drinking, and frequently from acute alcoholism.

There are certain arteries in the brain which seem to be more susceptible to rupture than others but it is not necessary to go into this matter in detail.

Apoplexy occurs more often on the right than on the left side of the brain and when it occurs there is an outpouring of blood from the ruptured artery into the brain substance. Shortly after the occurrence of the hemorrhage the blood discharged forms a clot. This clot is at first more or less soft and is of a dark color and is composed of the coagulated blood and a certain amount of brain substance which may have been broken away by the hemorrhage. This clot starts up an inflammation in the brain tissues and as a consequence a certain amount of new connective tissue is formed which acts as a sort of a wall around the clot. The clot is gradually absorbed leaving a certain amount of scar tissue. In some cases, however, the brain tissue around the clot softens and degenerates.

The amount of hemorrhage varies in different cases; in some it is small but in others it is quite large. It may develop very suddenly with a rush of blood from the ruptured artery into the brain tissues or in some cases and especially if the artery is very small or is not greatly torn the blood may escape somewhat more slowly. Large hemorrhages usually cause almost immediate death.

Symptoms of Apoplexy. In many cases of cerebral hemorrhage there may be no particular or characteristic symptoms before the occurrence of actual hemorrhage.

The attack comes on very suddenly and the patient will at once become partially or completely unconscious. In other cases there are what are termed *prodromal* or *warning* symptoms which should give advance notice of the imminence of an attack to those persons who are suffering from arterial disease. These symptoms consist of headache which is often extremely severe, vertigo or dizziness, sudden temporary attacks of blindness or deafness, and the development of numbness or loss of sensation in the extremities. There is also temporary loss of use of these extremities. The patient is seized with a fearful dread of impending danger.

When an attack occurs it may be accompanied by a vomiting spell which is followed by partial or complete unconsciousness, or the unconsciousness may develop without the occurrence of nausea and vomiting or even without any of the warning symptoms mentioned above. When unconsciousness occurs it may cause the patient to become entirely limp or he may develop spasmodic twitchings or have convulsions. The breathing becomes slow but quite noisy.

During inspiration the cheeks are drawn in and there is a snoring noise made; during expiration there is a puffing out of the cheeks. The large arteries in the neck can often be seen to pulsate. Both the heart action and the pulse are slow and full. There is a great deal of congestion of the face which becomes reddened and sometimes bluish in appearance, the eyes are bloodshot, and as a rule the pupils are unequal in size, one being normal and the other dilated though in some cases both pupils may be normal or both dilated. The pupils do not, how-

ever, react to light and holding a lighted match or other light before the eyes will not cause the pupils to contract as they otherwise would.

The body temperature is at first more or less lowered but within 24 hours it becomes elevated to 100 or 101 degrees F. or even higher. In cases which do not respond to treatment and which terminate fatally the body temperature often rises to 106 or 108 degrees F.

After the first few minutes of the seizure there is complete relaxation of the entire muscular system. In many cases however, the head and the eyes are turned toward the affected side, that is the side of the head in which the hemorrhage has occurred and opposite to the paralyzed side. Occasionally convulsions may occur during the progress of the disease but not often except at the very beginning of the attack.

The favorable sign in cases of "stroke" is the return of the patient to consciousness within a few hours after the attack. If consciousness does not return within twenty-four hours it argues unfavorably. In such cases the body temperature begins to rise, sometimes quite rapidly, the redness and congestion of the face disappears and it becomes pale, the pulse becomes rapid and irregular. In other cases there is developed a characteristic breathing known as Cheyne-Stokes breathing. In this form of respiration the breathing becomes shallower and shallower until it ceases entirely for several seconds; then a long and deep inhalation is taken and breathing is resumed again becoming shallower and shallower until it ceases once more. This form of respiration is very common in these cases though it does not occur in every case.

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Incontinence of urine and feces, that is, inability to control the action of the bladder and the bowel is a very common symptom of apoplexy and both urine and feces will be passed involuntarily.

Apoplectic seizures may last for a few hours or for several days. In those cases which recover from the attack consciousness is regained slowly and it is not until then that the existing paralysis is discovered. As the patient begins to show signs of improvement the ability to swallow, which was lost at the beginning of the attack, returns and there is also a return at least to some extent of active motion. In many of these cases facial paralysis develops and when this occurs there will be noted a sagging of the angle of the mouth on the affected side as well as a flattening of the wing of the nose on the same side and a drooping of the lower eyelid. Any facial wrinkles which may previously have been present are apt to disappear from the affected side or if they do not entirely disappear they will become much less noticeable. Saliva drools from the paralyzed side of the mouth. In breathing there is often quite a bit of lagging of the chest muscles on the side affected.

In some cases in which the attack has been mild no real paralysis may result though there will usually be temporary loss of power. In the vast majority of cases, however, there is paralysis of the extremities or at least of the legs on the side opposite to that hemisphere of the brain into which the hemorrhage occurred.

On the return of consciousness there are as a rule certain symptoms noticeable which are usually only temporary in their nature. These symptoms are headache

and a general confusion of the mind. These symptoms may be very troublesome while they last but fortunately they disappear within a reasonable length of time.

The paralysis which follows a stroke of apoplexy is both motor and sensory, that is, one is able neither to feel anything in the affected limb or limbs or to move them. In addition to paralysis of one or more limbs there is also generally some paralysis of the muscles of the tongue causing the speech to become more or less inarticulate. In a large percentage of cases the speech is eventually restored though in some cases the inability to speak plainly becomes permanent.

Cerebral hemorrhage may occur in various portions of the brain and as a consequence the paralysis and other symptoms which develop will appear in certain parts of the body depending upon the portion of the brain affected, the nerves from the affected part going to these certain portions of the body.

In all cases there is some paralysis but in addition there are in some cases the development of convulsions. In some cases the paralysis is one-sided while in other cases only one extremity or some other part of the body may be affected while in still others both sides of the body may suffer.

Paralysis of the muscles of the face, tongue, trunk and extremities on one side of the body constitutes what is known as *unilateral* paralysis or right or left *hemiplegia* as the case may be. Paralysis of both sides of the body due to simultaneous hemorrhage on both sides of the brain is termed *bilateral* paralysis or *diplegia*. Paralysis of one side of the face and the extremities on the other

side of the body is known as *alternating* or *crossed* paralysis. This latter form is due to hemorrhage into a certain portion of the brain called the *pons varolii*.

Other results of apoplexy are occasional contractions in the paralyzed muscles constituting a temporary rigidity, or the occurrence of twitching movements somewhat resembling the spasmodic jerking of chorea or St. Vitus' Dance.

In some cases the mental powers of the patient may become permanently affected and there is more or less loss of memory and an increased amount of irritability, the patients often developing an extremely emotional complex.

Treatment of Cerebral Hemorrhage. On the occurrence of an apoplectic seizure emergency treatment should be prompt. All clothing should be loosened and all constricting corsets, corselettes, garters, collars or neckties should be removed. The patient should be laid on a bed or on a couch on the back but care should be taken to see that the head and shoulders are somewhat raised. The face may be inclined somewhat downward so that mucus and saliva as well as the tongue will fall forward instead of backward into the pharynx, possibly interfering with respiration, or allowing mucus or saliva to drop into the larynx. Wet cloths are to be applied to the head and the feet are to be placed in hot mustard water. The windows in the room should be opened wide to allow of free ventilation and to secure the greatest amount of fresh air possible to the patient. This is about all that can be done at the moment but it is often of great value and may serve to check further hemorrhage and possibly

prevent convulsions. Many doctors resort to blood letting with the idea of relieving the congestion in the brain and lowering the blood pressure. An enema may be given at once though care must be taken not to unduly disturb the patient. After consciousness has been restored one may begin to apply constitutional treatment.

This is directed in a large measure toward improving the general chemical balance of the blood and will be of value as attacks of apoplexy are generally the result of arterial disease. In the majority of cases where consciousness has been restored and constitutional measures are to be begun the first step is to start a fast. A large percentage of those who are attacked with apoplexy are full blooded, large, heavy and often adipose people who have been used to eating rich foods and possibly indulging in alcohol very liberally. In all cases where the physical condition is such that a fast is permissible it is well to institute this procedure at once. The fast is, however, to be continued for only a few days, usually two to four, except in cases where the patient is much overweight but when this is the case the fast may be continued as long as the physical condition will permit.

During the fast a daily warm enema is to be taken and a considerable amount of pure, cool water is to be drunk.

Special Diets in Apoplexy. In some cases, especially if the patient is in a much run down or much weakened condition, or if he be considerably underweight, a fast may be considered inexpedient. In such cases a fruit juice diet may be given in place of the fast and the length of time this diet is to be continued will depend upon the general condition of the patient. The diet must be very

carefully carried out in cases of apoplexy. Even those on the lightest kind of a diet must not be overfed. The giving of too much food at each feeding may overload the stomach, cause the formation of gas, overstimulate the heart action and tend to produce another attack, possibly with very serious results. If a complete fast is given it may be broken by an orange juice diet for from one to two days in the case of a short fast, and for a longer period in the case of a more protracted fast. As a substitute for the orange juice diet the following fast-breaking diet can be adopted if desired:

First day: Three meals consisting of one kind of juicy fruit, the meals to be taken at least five hours apart.

Second day: Three meals consisting of one kind of juicy or citrus fruit, one sweet fruit and one glass of milk.

Third day and thereafter until a more liberal diet begins:

One pint of warm milk in the morning and again in the evening and in the middle of the day a fruit salad and if the patient is in very good general condition a small portion of a cooked tender vegetable and a glass of sour milk.

Sometimes it is advantageous after discontinuing the above diet to start a milk diet and continue it for a variable length of time according to results. If, however, the patient is of normal weight or is overweight and if his digestive apparatus is in good condition it may be advantageous to continue the fast-breaking diet specified above for some little time before making any change. Or, instead of this and in place of the milk diet any one of the

following diets may be tried. These are known as fruit diets and are frequently given to very good advantage.

1.—A.M. One grapefruit, three steamed figs; Noon, One apple, four dates; P.M., One pear, one banana. Vary juicy and sweet fruits from day to day.

2.—A.M. Rice gruel, date puree, apple sauce (small portion): Noon, Carrot, banana or pear puree; P.M., Pea, peach or prune puree, and $\frac{3}{4}$ glass of whole milk.

3.—Three meals daily of acid fruits but not more than one kind at each meal.

4.—Two meals daily of acid fruits, two fruits at each meal.

5.—Three meals daily of one or two kinds of acid fruits chopped and sweetened with a little honey.

6.—Three meals daily of acid and sweet fruits but only one kind of each at each meal. Good combinations are peaches and dates, oranges and bananas, apples and figs, plums and raisins, grapes and bananas, apples and dates, pears and bananas.

In taking this diet when both sweet and acid fruits are taken at the same meal it is well to chew them together or to mix them together before eating them.

If the exclusive milk diet should be followed, too much milk must not be given. As a rule no more than three or three and one-half quarts should be given daily although there are some persons who can take as much as four quarts to advantage. One should not, however, overload the stomach with fluids as this tends to increase the fluid contents of the blood which is not desirable.

Hydrotherapy in Apoplexy. The constitutional treat-

ment of apoplexy may well be begun by the application each morning of hot spinal compresses for from one-half an hour to one hour in duration. The packs may be changed two or three times during each application, being made hotter each time they are changed. If thought advisable, a cold abdominal pack may be given toward evening if the patient feels very warm. If on the contrary, the patient complains of being chilly, a hot abdominal pack may be used instead of the cold pack. The pack is to be made as hot as can be comfortably borne by the patient, and at the same time a cold compress is to be applied to the patient's head or to the back of the neck and removed when the abdominal pack is removed. Sponging the body with a mixture of alcohol and warm water is often exceptionally soothing to the patient. Warm water baths are also frequently very gratifying and soothing.

Importance of Bowel Evacuations in Apoplexy. The condition of the bowels must be very carefully watched and a daily evacuation secured. This may be more or less difficult in many cases and it may be necessary to resort to the use of the warm enema from time to time, at least in the beginning of the treatment, though later on when the patient is eating a fair amount of food the use of leafy green vegetables and other vegetables containing bulk will often tend to regulate the bowels and cause daily evacuations. However, as many of these patients recover with a permanent paralysis and are not able to exercise or get about by themselves but must either keep to the bed or sit in a wheel chair, or if they do get about must do so with the aid of crutches, constipation is very apt to develop. In cases where diet alone is not sufficient

to cause daily evacuations and where the patient cannot go through any exercises himself, passive exercise given by an attendant is often of the greatest value. Abdominal massage, given with a clock-wise motion is an excellent procedure. Exercises involving the raising and lowering of the legs and pressing the thighs up against the abdomen are also recommended as of value. Mineral oil and agar agar may often be given to good advantage as well as an occasional high colonic irrigation.

Amount of Urine Excreted to Be Noted. An important matter is the observance of the amount of urine excreted daily by the patient. In many cases of apoplexy the kidneys are apt to be more or less diseased and their function interfered with owing to the existence of arteriosclerosis of the renal arteries. In such cases the urine is apt to be scanty in amount, high colored and heavy usually containing albumin and casts of various kinds as well as blood. When this condition exists special treatment directed to the kidneys must be instituted. As a rule in such cases a milk diet is of value as well as hot packs applied over the lower back, and the avoidance of any food although fruit and vegetables may later be given with the milk.

Other Important Measures in Apoplexy. If the patient is unable to articulate plainly or to make his wants understood it is of the utmost importance for his attendants to watch him very carefully and anticipate those wants as much as possible inquiring of him from time to time about his needs. If this is done it may prevent retention of urine and also may tend to the prevention of constipation as well as keeping him from suffer-

ing many discomforts which he is not able to make known in words. Many such patients suffer from unintentional neglect and this should not be allowed.

Massage and passive motions such as Swedish movements should be continued for a considerable period of time the amount and character being regulated by the general physical condition of the patient.

Very frequently patients whose speech is affected can be re-educated and trained to speak more distinctly so that they may not only make their wants known but they may to a certain extent enjoy the ability to join in ordinary conversation and be intelligible to their listeners.

It must always be kept in mind that those who have had one attack of apoplexy are apt to have subsequent attacks and therefore every effort must be made to make these persons live as simply as possible and their lives must be so regulated as to avoid every excitement. The members of the family must be on their guard against exciting the patient or becoming excited among themselves as this will be very apt to have a very bad effect upon him and may induce another attack.

The mild faradic electric current may often be applied to paralyzed limbs after the second or third week following a seizure and is often of considerable value. The electric current is best applied to any paralyzed or contracted muscles several times a day for four or five weeks.

CHAPTER TEN

Building Health in Middle Life

TO WRITE this book plainly and without the use of unnecessary technical terms has been the aim of the author. To that end he has, whenever it could be done, used simple, everyday words instead of technical terms and when medical or technical terms had to be used has attempted to explain their meaning in language easily understood by the laity for whom this book is intended.

Most of the disorders described within these pages are of more or less insidious origin but all are practically diseases which can be avoided by adopting proper habits of living while in our younger years.

To those of our readers who are already suffering from any of the diseases which develop during middle life let it be said that one's years can be prolonged and one can often live to ripe old age by, even at a late day, recognizing what Nature can still do for one even after her laws have been broken persistently for many years. By mending one's ways and one's habits of living and by following Nature's methods, attempting to undo as much of the damage already done as is possible, the remainder of one's life may be made comfortable and complacent.

One must however, remember that improvement depends entirely upon living an even, calm life of extreme

moderation, being careful to limit one's diet to simple, natural, unrefined and unadulterated foods. One must get a sufficient amount of rest, exercise, fresh air and bathing and must also pay strict attention to the eliminations from the bowels, the skin and the kidneys. The avoidance of over-exertion, hurry, worry, overwork either physical or mental, and the observance of a proper mental attitude toward one's self and toward life in general is imperative.

One should follow his or her individual occupation with as little strain or tension as possible. One should go about one's duties as calmly and as easily as one can. One should avoid becoming wrought up or excited over business and should never act in excited haste.

Of course, it is extremely easy to give advice, but not always so easy to have it followed. When, however, one knows exactly what he should do and what the consequences of not doing it may be, he certainly should make an effort to adopt the measures which he knows will be not only beneficial but necessary if good results are to be expected. Many persons go to physicians for advice and are told to do certain things. They say, "That is all very well, Doctor, but I can't do these things." They may or may not be right. However, many people think that they cannot arrange their affairs so that they can take more or less care of themselves but find that it can be done after all. When one's health and perhaps one's very life depends upon doing certain things they somehow can be done.

Most people suffering from disease of the heart and arteries as well as of the lungs, do better in a warm, dry

and more or less even climate, one without sudden, marked changes of temperature. Long vacations are also of great value, but it is an extremely bad plan for a person to retire from active life, if he still can work, because this usually means too little exercise and activity and a general loss of interest in the things of life, all of which is undesirable.

By carefully observing the suggestions laid down in these pages many afflicted persons may be relieved to such an extent that their subjective symptoms may practically disappear and they may live to a ripe old age and enjoy life practically to the full. It is easy to accustom one's self to a methodical life, especially when one notes the benefit to be derived from such regularity, and the results will always justify persistence in following the natural methods suggested.

To the younger generation, those who have not yet reached middle age and who have not as yet developed any of the diseases incident to middle life we say—Be warned in time! Live properly; attain vigor and vitality; maintain strength, energy and health that you may escape the various diseases that in later years creep upon one unawares.

Even if you may be subject to such diseases, you can mend your ways; live properly from now on; purify your poisoned bloodstream and get rid of accumulated toxins. Then Nature will help you to either check the further development of your disease or at least to bear with it more complacently. It can be done; it has been done, and what others have done you also can do.

Do not be discouraged; there is hope—there is a promise. But you must do your own part thoroughly, faithfully and persistently.

The reward will repay the effort.

THE END

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